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8/7/97

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TRANSACTIONS

OF THE

Vermont State Medical Society

For 1895 and 1896.

PUBLISHED BY THE SOCIETY.

D. C. HAWLEY, M. D., Secretary.

Annual Meeting in 1897 at St. Albans, Oct. 14th and 15th.

NOTE.—Each article published herein, stands upon its own merits as the expression of its author's opinion, for which the society does not hold itself responsible.

BURLINGTON
FREE PRESS ASSOCIATION
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1897

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OFFICERS.

1895-96.

C. F. BRANCH, President, Newport.
LYMAN ROGERS, Vice-President, Bennington.
D. C. HAWLEY, Secretary, Burlington.
D. G. KEMP, Treasurer, Montpelier.
L. M. GREENE, Auditor, Bethel.

EXECUTIVE COMMITTEE.

C. F. Branch, D. C. Hawley, A. B. Bisbee.

PUBLICATION COMMITTEE.

D. C. Hawley, M. C. Twitchell, H. R. Watkins.

LICENSE CENSORS.

C. W. Strobell, H. C. Tinkham, F. F. Chaffee.

COMMITTEE ON NECROLOGY.

C. W. Peck, D. F. Rugg, E. M. Brown.

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TRANSACTIONS

OF THE

EIGHTY-SECOND ANNUAL MEETING

OF THE

Vermont State Medical Society

HELD IN

Burlington, October 10 and 11, 1895.

The Society convened in the Chittenden County Court House in Burlington, on Thursday, Oct. 10, at 10 o'clock a. m., and was called to order by the President, Dr. J. H. Linsley of Burlington.

Prayer was offered by the Rev. P. M. Snyder of Burlington.

PRAYER.

Our Heavenly Father, we thank Thee that Thou hast committed the coming of Thy kingdom and the doing of Thy will on the earth, not to the ministry of the angels, but to the faithfulness and the loving kindness of men.

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We thank Thee for all those who in any way are striving to hasten the coming of Thy kingdom into the lives of the world,—for the spirit of self-forgetfulness and brotherly love and service of all those who strive to pattern after the life and ministry of Him who went about doing good.

We thank Thee for the measure of devotion, of worship, of faithfulness which has been revealed in Thy life, and entered into the homes and lives of those round about us.

And now, we pray that Thou wilt grant a blessing in the future, as in the past, and much more abundantly, not only upon each of us who are present here to-day, but also upon those lives that are associated with them, working and striving to find the revealing of Thy will.

We pray, Father, that in all these things Thou wilt be with us and grant Thy benediction upon us; that words may here be spoken and deliberation be held that will strengthen those who go out, and make them more useful and better fitted for the blessed and divine calling which is theirs. May all the laws of nature and the laws of life strengthen their faith and their confidence in Thee.

We pray that into all our hearts may come the spirit of Him whose mission it was to finish Thy work. That we may count no task too great or too small to undertake, if called by the spirit of Jesus Christ.

Hear us and bless us, granting indeed Thy benediction upon the sacred and divine work of this body as they go to their various dwelling places, showing that they are working with Thee. Amen.

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The records of the last annual meeting were read and approved.

The President announced the following committees: First, Committee on Nominations, Drs. H. C. Tinkham, E. H. Martin, M. R. Crain, C. F. Branch and F. R. Stoddard; second, Committee on Membership, Drs. O. W. Sherwin, F. C. Morgan and H. R. Watkins.

Dr. D. C. Hawley, secretary, presented his annual report, as follows:

Mr. President and Gentlemen of the Vt. State Med. Society:

The close of this, the 81st year of the existence of this Society, finds us with a membership of 191, which is I believe the largest in our history.

Many changes in our constitution and By-Laws, and in the general working of the Society have taken place within the last few years. For three years past the transactions have appeared in book form, which I consider a great improvement. A stenographer is now employed to take all discussions, and these appear in the Transactions with their respective papers. This adds to the value of our Transactions.

Since 1889 the Annual Banquet has been a feature of our meetings and it has proven to be one of our pleasantest and most profitable sessions. However, as you have just learned from our Treasurer's report, these improvements have depleted the treasury. My object in referring to this matter in my report is to call your attention to the necessity of raising our annual dues from two to at least three dollars per year.

In most State Societies the dues are higher than in ours, and in many, are five dollars per year.

Respectfully submitted,

D. C. HAWLEY, Secretary.

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Dr. C. W. Peck of Brandon reported as delegate to the Medical Department of the University of Vermont.

To the Vermont State Medical Society:

Your delegate, according to appointment, attended the examination of the graduating class of the Medical Department of the University of Vermont, at Burlington, July 2d and 3d, 1895.

The examinations were both oral and written. There were 54 candidates in the graduating class, 47 of whom passed to the great fields of practice as Doctors in Medicine.

The examinations as a whole, as witnessed by your delegate, were a fair and impartial test of the candidates' knowledge of the subject, with all due consideration for the pupil, and at the same time requiring the necessary knowledge on the part of the candidate, to maintain that high standard of medical education to which we all so justly aspire.

With no disposition to criticise or eulogise either department it is the opinion of your delegate that special mention should be made of some of the examinations; as, for example, those in Anatomy, Physiology, Pathology and Practice, Obstetrics and Surgery, as being particularly broad and comprehensive, showing not only a technical knowledge of the subject, but a comprehensive understanding of the principals involved.

The examination in Chemistry impressed your delegate as being unnecessarily severe for any one but an expert in Chemistry, although the teaching may have been such as to warrant it, and this it undoubtedly was since the class received a high mark in this department.

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The examination in "Materia Medica" was both written and oral, and as your delegate's opportunity for witnessing the oral examination was limited, and not having received a list of the questions, he is unable to judge so well of its merits.

Your delegate feels that the Medical Department of the University of Vermont is indeed a great credit to our state; an institution of which we should all be justly proud, connected as it is with that great Charity, the "Mary Fletcher Hospital," whose endless chain of noble work reaches every hamlet in the state, giving medical aid and surgical assistance gratuitously to thousands.

And this is not all; the same old principle underlies all good deeds, that in as much as we help others we help ourselves; so the medical men of Burlington are enjoying a rich harvest in medical experience by being in touch with the living, progressive medical sentiments of the day.

Respectfully your delegate,

C. W. PECK.

Dr. W. D. Huntington of Rochester, read a paper entitled "Our Profession," which was discussed by Dr. A. P. Grinnell.

Dr. George Davenport, after discussing the subject matter of the secretary's report, offered the following:

Resolved, That section I, of article II of the By Laws be amended to read as follows:

"Every member of this Society (honorary excepted) shall pay to the treasurer an annual fee of three dollars."

The resolution was unanimously adopted, and will under the By Laws, lie over until next year for action.

On motion adjourned.

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AFTERNOON SESSION.

Called to order at 2.15 o'clock.

The Address in Medicine, being the Vice President's address, was presented by F. F. Chaffee of Hartford. Subject, "Chronic Gastritis."

Discussion followed by Drs. H. R. Wilder, W. N. Bryant and F. C. Morgan.

"Cholelithiasis," was the subject of a paper by Dr. E. H. Martin of Middlebury, which was discussed by Dr. L. W. Hubbard.

Dr. Wm. H. Porter of New York, presented an exhaustive paper upon Intestinal Indigestion, Its Dietetic and Rational Treatment. Discussion of the subject was participated in by Drs. J. Henry Jackson, M. R. Crain, O. W. Sherwin and L. M. Greene.

A vote of thanks was extended Dr. Porter and he was unanimously elected an honorary member of the Society.

Dr. L. M. Greene of Bethel, read a paper entitled "Cases of Tuberculosis treated with Tuberculin and Antiphthisin. Discussed by Dr. C. W. Peck.

Dr. F. C. Morgan of Felchville, read a paper on "Diabetes Mellitus" which was discussed by Dr. W. H. Vincent.

Adjourned.

EVENING SESSION.

Met at 8 o'clock, Vice President F. F. Chaffee in the chair.

Dr. J. H. Linsley of Burlington, presented the President's Annual Address. Subject, "Some suggestions con-

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cerning the Examination of Blood." The subject was discussed by Drs. J. H. Jackson, J. N. Jenne, O. W. Sherwin and G. B. Bullard.

Adjourned at 9.35 p. m.

The Annual Banquet was held at the Van Ness House after the close of the evening session, with Dr. A. B. Bisbee of Montpelier, as Anniversary Chairman.

SECOND DAY.

FRIDAY, OCTOBER 11, 1896.

Met at 9.20 a. m.

The Nominating Committee presented their report which was unanimously adopted, as follows:

OFFICERS AND DELEGATES.

President,	C. F. BRANCH,	Newport.
Vice President,	LYMAN ROGERS,	Bennington.
Secretary,	D. C. HAWLEY,	Burlington.
Treasurer,	D. G. KEMP,	Montpelier.
Auditor,	L. M. GREENE,	Bethel.

EXECUTIVE COMMITTEE.

C. F. Branch, D. C. Hawley, A. B. Bisbee.

PUBLICATION COMMITTEE.

D. C. Hawley, H. R. Watkins, M. C. Twitchell.

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COMMITTEE ON NECROLOGY.

C. W. Peck, D. F. Rugg, E. M. Brown.

ANNIVERSARY CHAIRMAN.

H. C. Tinkham.

DELEGATES.

Univ. of Vt., Med. Dept. { F. S. Gray, Troy. / J. M. Allen, St. Johnsbury.

Dartmouth Medical College, { C. S. Caverly, Rutland. / Joel Allen, Burlington.

N. H. Med. Soc. C. E. Chandler, C. F. Camp.

Me. Med. Asso. Lyman Rogers, H. O. Worthen.

Mass. Med. Soc. J. H. Jackson, D. W. Hazelton,

R. I. Med. Soc. W. L. Havens, C. C. Smith.

Conn. Med. Soc. R. T. Johnson, E. R. Campbell.

N. Y. Med. Asso. W. H. Vincent, O. C. Baker.

N. Y. Med. Soc. D. C. Hawley, C. W. Peck.

Northern N. Y. Med. Asso. S. W. Paige, H. R. Wilder.

White Mountain Med. Asso. R. B. Skinner, L. W. Hubbard, W. D. Huntington.

Conn. River Valley Med. Asso. M. R. Crain, J. S. Richmond.

AMERICAN MEDICAL ASSOCIATION.

C. F. Branch, O. W. Sherwin, M. R. Crain,
A. L. Bingham, E. W. Shipman, J. M. Hamilton,
H. Janes, E. H. Martin, R. M. Canfield,
D. G. Kemp, F. R. Stoddard, F. W. Sears,
H. C. Tinkham, C. W. Peck, J. H. Linsley,
D. C. Hawley.

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On motion of Dr. G. B. Bullard it was voted to hold the next meeting in St. Johnsbury.

Dr. C. S. Caverly presented the address in State Medicine. Discussion was postponed.

Dr. S. C. Gordon of Portland, Me., presented a paper on "The Medical and Surgical Treatment of Appendicitis," which was discussed by Drs. L. M. Bingham, A. T. Woodward, R. M. Canfield and W. H. Vincent.

A vote of thanks was extended to Dr. Gordon for his paper and he was elected an honorary member of the Society.

Adjourned.

AFTERNOON SESSION.

Met at 2:20 o'clock.

Dr. M. R. Crain presented the following:

Resolved, "That a committee of three be appointed to endeavor to secure better legislation in regard to the granting of licenses to practice medicine."

The resolution was adopted and Drs. M. R. Crain, E. S. Allbee and H. R. Wilder were elected as such committee.

"The relation of the Medical Profession to certain social conditions" was the subject of a paper by Dr. Chas. H. Cook of Natick, Mass. A paper entitled, "The Border Lands of Insanity," was read for Dr. S. E. Lawton of Brattleboro, by Dr. W. N. Thompson of that place. Discussed by Dr. J. M. Clarke.

Dr. L. Bolton Bangs of New York read a paper entitled, "The prostate, some of its acute and chronic

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conditions, and their treatment." The paper was discussed by Drs. H. C. Tinkham and S. C. Gordon.

Dr. J. B. Wheeler of Burlington presented the address in surgery entitled "The radical cure of inguinal hernia," and Dr. Edw. R. Campbell of Bellows Falls read a paper on "Antitoxin treatment of Diphtheria."

It was voted to make the Vermont Medical Monthly the official organ of the Society.

The following physicians were elected to membership during the meeting.

C. M. Scribner, Barre.
O. H. Allard, Winooski.
M. C. Twitchell, Burlington.
M. F. McGuire, Burlington.
D. H. Calder, Burlington.
E. R. Cooke, Burlington.
H. A. Barker, Burlington.
W. J. Aldrich, St. Johnsbury.
J. Sutcliffe Hill, Bellows Falls.
J. M. Hamilton, Proctor.
F. E. Clark, Burlington.
F. C. Liddle, Dorset.
P. H. McMahon, Burlington.
L. C. Holcombe, Milton.
L. S. Tesson, Fort Ethan Allen.
W. N. Thompson, Brattleboro.
A. T. Arkley, Essex Junction.
H. R. Townsend, Bridport.
W. W. Townsend, Rutland.
S. E. Maynard, Burlington.
W. N. Bryant, Ludlow, Reinstated.
A. W. Rice, Montpelier, Reinstated.

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The Executive Committee reported the following program for the next meeting:

Address in Medicine, Lyman Rogers.

Address in State Medicine, J. H. Jackson.

Address in Surgery, D. C. Hawley.

The management of acute peritonitis, from a medical standpoint, W. H. Vincent.

Papers (titles unannounced) by J. S. Hill, W. S. Nay, F. R. Stoddard, J. M. Allen, L. W. Hubbard, E. H. Bushnell, I. N. Fowler, W. R. Prime, R. M. Canfield, H. C. Tinkham, J. M. Hamilton, M. D. Warren and H. A. Barker.

Dr. E. S. Albee, Chairman, presented the following report of License Censors.

LICENSES GRANTED.

1894.

Oct. 23 W. A. Lyman, Burlington, U. V. M. '94.

1895

Jan. 29 David G. Underwood, Westminster, Balt.M.C.'94.

Feb. 1 F. C. Russell, Newbury, Vt., Dart. M. C., '94.

" 1 C. E. Merriam, Hinesburg.

" 15 F. C. Fletcher, Roxbury, U. V. M., '93.

" 15 L. A. Russlow, East Randolph.

" 16 R. E. Prentiss, Johnson, U. V. M., '94.

Mar. 23 S. W. Eastman, Groton, Dart., '84.

" 11 J. C. Morgan, Stowe, '94.

" 23 S. Gould Start, Bakersfield, Bellevue M. C., '95.

May 20 B. A. Chapman, Ludlow, Balt. M. C., '95.

June 14 P. P. White, Williamsville, U. V. M., '83.

" 25 F. P. Van Denbergh, Burlington, Albany M.C.'94.

" 25 E. A. Cordin, Swanton, U. V. M., '95.

" 25 W. H. Bertram, E. Boston, Mass., P. and S. Boston, Tufts, '91–95.

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July 19 C. H. Bonney, Ludlow, Balt. M. C., '94.
" 19 M. P. Stanley, Bethel, " " '95.
" 19 Philo Cheseborough, Edmeston, N.Y.,U.V.M.'95
" 19 John E. Burby, Ft. Edward, N. Y.,Balt.M.C.'95.
" 23 W. K. Quackenbush, Castleton, Albany M.C.'95.
" 30 L. E. Stillings, Rutland, U. V. M., '95.
" 30 H. B. Rising, Whitingham, Yale, '95.
Aug. 3 M. J. La Bell, Lewis, N. Y., U. V. M., '95.
" 31 W. E. Lilley, Barnard, Balt. M. C., '95.
" 31 F. C. Crosby, Brattleboro, Dart. M. C., '95.
" 31 J. W. Sanson, Burlington, U. V. M., '95.
Sept. 4 M. F. McGuire, Burlington, " '95.
" 9 G. A. Blanchard, Woodstock, U. of Pa. '95.
Walter C. Heath, U. V. M., '92.
Wm. R. Sedgwick, Univ. M. C., N. Y., '87.
Elmer A. Burdick.
Harwood Vernon, U. V. M., '95.
H. A. Barker, University N. Y., '83.
E. M. Cram, U. V. M., '95.
John O'Connor, by examination, '95.
E. E. Ellis, U. V. M., '95.
S. D. McAlliston, " '95.
J. W. Shehan, " '95.
John A. Drew, " '95.
C. F. Ferrin, P. and S., New York, '95.
F. C. Page, U. V. M.

E. S. ALLBEE,
Chairman Board of Censors.

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ATTENDANCE.

O. W. Sherwin, Woodstock.
F. T. Kidder, Woodstock.
L. W. Hubbard, Lyndon.
G. B. Bullard, St. Johnsbury.
J. E. Hartshorne, St. Johnsbury.
F. R. Stoddard, Shelburne.
C. F. Hawley, Fairfax.
F. C. Morgan, Felchville.
W. D. Huntington, Rochester.
C. C. Smith, Gaysville.
Lyman Rogers, Bennington.
Geo. Davenport, East Randolph.
J. Henry Jackson, Barre.
H. O. Worthen, Barre.
C. F. Camp, Barre.
J. D. Tanner, Winooski.
O. W. Peck, Winooski.
A. W. Rice, Montpelier.
D. G. Kemp, Montpelier.
J. S. Hill, Bellows Falls.
E. S. Allbee, Bellows Falls.
F. W. Sears, South Hero.
C. W. Brigham, Rutland.
M. R. Crain, Rutland.
W. W. Townsend, Rutland.
Wm. F. Cummings, Rutland.
C. S. Caverly, Rutland.
F. C. Liddle, Dorset.
L. C. Holcombe, Milton.
C. M. Ferrin, Essex Junction.

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A. T. Arkley, Essex Junction.
Geo. H. Newton, Cambridge.
C. W. Peck, Brandon.
O. C. Baker, Brandon.
W. H. H. Varney, Charlotte.
W. H. Vincent, Orwell.
C. F. Branch, Newport.
M. H. Eddy, Middlebury.
E. H. Martin, Middlebury.
F. F. Chaffee, Hartford.
J. M. Hamilton, Proctor.
J. H. Hamilton, Richford.
W. S. Manuel, Richford.
Henry Janes, Waterbury.
Chas. P. Newton, Underhill.
W. S. Nay, Underhill.
J. N. Jenne, St. Albans.
Geo. Dunsmore, St. Albans.
L. M. Greene, Bethel.
A. B. Bisbee, Montpelier.
Wm. R. Hutchinson, Enosburg Falls.
A. T. Woodward, Brandon.
Harold Vernon, New York, N. Y.
Geo. H. Gorham, Bellows Falls.
Edw. R. Campbell, Bellows Falls.
H. W. Barrows, Stowe.
George B. Hulburd, Jericho.
T. F. Gartland, White River Junction.
I. N. Fowler, Groton.
F. L. Brigham, Pittsford.
W. W. Styles, Essex.

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M. D. Warren, Cabot.
Wm. Lindsay, Georgia.
W. W. Hutchinson, Enosburgh.
J. A. Howard, Alburgh Springs.
J. B. Woodhull, North Bennington.
R. M. Canfield, Stanstead, P. Q.
E. H. Bushnell, Jeffersonville.
A. L. Bingham, Williston.
S. E. Darling, Hardwick.
L. S. Tesson, Fort Ethan Allen.
C E. Allen, Swanton.
E. W. Shipman, Vergennes.
A. L. Miner, Weston.
W. N. Thompson, Brattleboro.
B. Haynes, Grand Isle.
J. H. Linsley, Burlington.
Joel Allen, Burlington.
P. H. McMahon, Burlington.
J. M. Clarke, Burlington.
F. E. Clark, Burlington.
H. R. Watkins, Burlington.
P. E. McSweeney, Burlington.
A. P. Grinnell, Burlington.
W. R. Prime, Burlington.
D. C. Hawley, Burlington.
D. H. Calder, Burlington.
Wm. B. Lund, Burlington.
B. J. Andrews, Burlington.
Geo. C. Briggs, Burlington.
F. A. Rich, Burlington.
M. F. McGuire, Burlington.
E. R. Cooke, Burlington.

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A. J. Willard, Bulington.
H. A. Crandall, Burlington.
H. A. Barker, Burlington.
L. M. Bingham, Burlington.
W. G. E. Flanders, Burlington.
J. B. Wheeler, Burlington.
M. C. Twitchell, Burlington.
S. C. Gordon, Portland, Me.
Wm. H. Porter, New York City.
L. Bolton Bangs, New York City.
Geo. N. Lawson, Middle Haddam, Conn.
Edwin W. Dwight, Boston, Mass.
Chas. H. Cook, Natick, Mass.
J. M. Fay, Northampton, Mass.
Chas. A. Lamson, Scytheville, N. H.

Total attendance, 108.

On motion, adjourned.

D. C. HAWLEY, M. D., Secretary.

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President's Address.

SOME SUGGESTIONS CONCERNING THE EXAMINATION OF BLOOD.

By J. H. Linsley, M. D., Burlington, Vt.

Members of the Vermont State Medical Society:—

Section I, Article I of our By-Laws, referring to the duties of the President, contains the following: "He shall deliver, or cause to be read, an address or dissertation on some medical subject at the annual meeting."

In discharging this duty I desire to call your attention to a very few ethical matters before taking up the text proper of this address.

It is a cause for mutual congratulation that the proportion of attendance to the total membership is steadily increasing. Now while this is a very commendable condition, the fact remains that this proportion is still far short of what it should be, ought to be, and *would* be, if every member would feel the individual responsibility in the Society's success which his signing of the Constitution implies.

Another evidence of increasing interest is the greater willingness on the part of the members to prepare and read

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papers at our meetings. But a few years since it was a matter of some considerable difficulty on the part of the Executive Committee to secure papers enough to fill out the programme for two days, but considerable maneuvering is now necessary to see that all papers prepared shall have adequate time for their delivery and discussion. Indeed so pressing has become this lack of time, that I seriously advise longer sessions, preferably by having the meetings extend from 2 o'clock Wednesdays, instead of 10 o'clock on Thursdays, as at present. It may be said in connection that those papers scheduled for presentation at the final, or Friday afternoon session, receive but scant attendance, a circumstance which is discouraging to their writers. I feel confident that this would be remedied by the establishment of longer sessions.

I would also suggest for your thoughtful consideration —in line with the matter of extended sessions—the desirability of the arrangement of the papers under the head of *sections*.

For instance: Having all papers on surgical topics read at one day's or half day's session, those on purely medical at another, gynæcological at a third, and so on. In this way those of us who were interested in any one line especially, would not be compelled to be in attendance during the entire three-days' session in order to hear such papers of especial interest which might be scattered over the time of the whole meeting.

Again I wish to express my appreciation and gratitude for the effort of those members of our profession who have come from abroad to entertain and instruct us in matters pertaining to their specialties, in the practice of which they are recognized authorities, and to call your attention to the

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great advantage, to most of us, in having several metropolitan physicians and surgeons with us at each annual meeting. I believe the adoption of such a course would prove of benefit alike to visitors and members.

* * * * * * * * *

I have selected as the text of this address, "Some suggestions concerning the examination of blood." This theme was chosen for three reasons: First, because I have given attention to the subject for some time; second, its great importance; and third, the very slight consideration given the matter by the average practitioner.

Many physicians are deterred from making blood examinations by the supposed difficulty of technique in the work, and the instruments and paraphernalia necessary for its conduct.

I shall endeavor to show that this conception of the matter is incorrect, and that a vast amount of exceedingly valuable information concerning the condition of our patient can be obtained by the examination of a drop of blood, with no greater outfit than a good microscope, clean cover-glass and slide, a little vaseline, a slip of paper, and a steel pen.

First, a cover-glass and slide are carefully cleaned. A piece of ordinary writing paper is then folded into a triangular shape, and after taking up a small quantity of vaseline on the point of the paper, a narrow, thin film of the vaseline is placed around the edge of the cover-glass. The end of one of the index fingers is carefully cleansed with water (it is better to employ a nail brush in doing this), and the finger pricked by a sharp, rapid movement of the arm of the operator, the instrument used being either a needle, which has been previously sterilized in a flame, or

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a new, sharp-pointed steel pen, one of the points of which has been broken off.

As soon as a small drop of blood has collected, the glass slide is brought in contact with the same, the slide placed on a level surface, and, as soon as possible, the cover-glass placed over the blood—vaseline side down—and sufficient gentle pressure made over the cover-glass to produce a contact everywhere between the border of vaseline and the slide. In this simple manner a most effective moist chamber is provided, which is completely sealed by the vaseline, and in which the blood will remain in a suitable condition for microscopical investigation for several hours.

Another method much employed, and especially useful where staining is desired, is the *dry* process. A clean cover glass is brought in contact with the summit of the drop of blood, obtained in the manner I have described, quickly removed, and a second cover-glass—or the end of a glass-slide—is immediately drawn across the blood, producing a thin, flat layer which drys almost at once. The preparation is then kept for ten or fifteen minutes at a temperature of 110° to 120° C., and is then ready for whatever staining is desired.

Before proceeding, allow me to call your attention, briefly, to the composition of normal blood, and to suggest the absolute necessity of familiarity on the part of the investigator, with the condition and appearance of normal blood.

For present purposes the chemistry of the liquor sanguinis and corpuscles, with the exception of haemoglobin need not be considered. I prefer to deal only with the corpuscular elements.

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As you all know, the cells of the blood are of two great classes,—the colored, or red, and the colorless, or white. I prefer the terms "*colored*" and "*colorless*" because none of the individual corpuscles are "red," but only a slight shade of amber, or yellow, while the others are devoid of color.

The normal colored blood corpuscle of man is a biconcave, circular disc, having an average diameter of 1-3250 of an inch. This diameter is liable to great variations—at least ⅓ in the same individual, and persons differ very much in the variance in size of their colored corpuscles. In some, the examination of thousands of cells will show no appreciable difference, while in others, the most remarkable variety of sizes is seen. I am not satisfied that this variability in size is of any pathological significance.

The same cannot be said from a *medico-legal* standpoint. Given a suspected blood-stain, on or about the clothing of an accused, or implements, or utensils supposed to have been used by him at the time of an assault, and the investigator finds but a few colored blood corpuscles, which are, apparently, of the same size as human colored blood-cells; *can the physician, however expert, go on the witness stand and conscientiously swear that they are even probably human blood corpuscles?* In the light of our present knowledge of this subject, I say *he can not.* It may be said in opposition to this statement that with proper micrometers the exact size of the corpuscles can be measured. Now it is a fact that only a very expert microscopist can make such a measurement accurately, and even then there is the liability to error as was shown by Ewell.*

*System of Legal Medicine. Allan McL. Hamilton, p. 175.

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This expert ruled a glass-slide with 15 lines, making spaces approximately of 1-250 to 1-125 of an inch, and caused the same to be measured by six well-known microscopists, who were instructed to take *the mean of at least 5 measurements of each space*. Using standard micrometers by the same maker, the result showed that the measurements of the same space by different observers varied from 0 to 1.9090. This is a *greater difference than that between the average diameters of the blood-corpuscles of man, and any of the common domestic animals, except the sheep and goat, according to all observers*.

Again it is not always possible to restore to corpuscles which have become dried in a stain, their normal diameter, after the most approved treatment of the same.

It is to be greatly regretted, in the cause of justice, that notwithstanding the facts just given, we often see medical men, with but a moderate amount of microscopical acumen, go on the witness stand and declare, with positiveness, as to the origin of a few colored blood-corpuscles which they had found in a suspected stain.

Nay,—I can go farther and point to the spectacle of a professional man, with but the most meagre knowledge of microscopical technique, posing as an expert, and giving testimony of the nature I have just indicated. The citation of a case in point may be pertinent.

"In the case of *Commonwealth vs. Piper*, tried in Boston in 1875, the defendant, a sexton, was charged with the murder of a child in the belfry of his church. Certain articles having upon them suspicious stains, were placed in the hands of several local experts for examination. Among the specimens was about a half-pint of water found in a pitcher in the basement, in which it was thought that the

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prisoner had washed his bloody hands. A short time previous to the trial, the experts, four in number, made their report of the results of their examination to the prosecuting officers, and every one of the four stated that the water contained blood-corpuscles which measured on the average about 1-3300 of an inch in diameter. This evidence was not given at the trial, because the government decided not to introduce any testimony in relation to blood, but the results stated in the report would undoubtedly have been given if it had been called for. A portion of the water was critically examined by Prof. Wormley, and the bodies which had been confidently measured as corpuscles were proved to be merely the *spores of a confervoid alga.*" We could, therefore, find in stagnant water, in drainage, surface pools, some springs, and in many other places, these bodies which are of the same diameter as the human colored blood-corpuscles, and resemble them so closely as to have been mistaken for them by experts, as I have quoted.

The number of colored blood-corpuscles in man is about 5,000,000 per cubic m. m., (or about one drop) in the male, and 500,000 less in the female.

The number is ascertained by the use of a Haemocytometer—that devised by Thoma and Zeiss being the most practical in use.

It consists, as you see, of a capillary tube of glass about 10 ctm. long, expanding in its upper ⅓ to a bulb in which lies a small glass ball. The lower end of the tube is furnished with a scale graduated in parts numbered 0. 5. 1., up to 101. With this instrument is used a counting chamber invented by Abbé and Zeiss. This is a glass receptacle cemented upon a glass slide—it is exactly 0. 1 m. m. in depth, and its floor is marked out into microscopic

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squares. The space overlying each square—1-4000 m. m., and the squares are portioned out in groups of 16 by plainer parellel lines.

To use the apparatus a puncture is made in the end of the finger, in the manner I have already described. Blood from the top of the exuding drop is then sucked into the tube until it reaches the mark 0. 5 or 10. The point of the tube is then wiped, and a 3 per cent sol. of common salt (or Hayem's Sol.*) sucked in until the fluid has risen to the point marked 101.

The contents of the tube are then thoroughly mixed, and the column of fluid in the capillary tube is removed by blowing into the tube, as the blood would not mix with the solution of salt.

This precaution is obviously imperative. The hollow cell of the slide is next filled with the mixed blood and salt solution, care being taken to guard against the admission of air bubbles, and the cover-glass accurately adjusted. The preparation is left to stand for some minutes, so as to allow of intimate admixture of its parts, after which it is placed under the microscope, and examined with a low power, to see if any air-bubbles or foreign bodies—such as epithelium, etc.—are present in it, and whether the corpuscles are pretty evenly distributed through the fluid. The latter are then counted under high power. In doing this, the number in 16 squares is counted, and from this the average is estimated.

The estimation of the total number of corpuscles is conducted as follows: If the blood in the tube reached to the point 0. 5, its proportion in the mixed solution will be

*Hayem's Solution :—1 grm. of chloride of sodium, 5 grms. of sodic sulphate; 0.5 grms. of corrosive sublimate and 200 grms. of diluted water.

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1.200; if to the point 1. 0, 1.100. Multiply the number of corpuscles counted in all the squares by 4000 (1-4000 being the cubic contents overlying a square) and the result by 100 or 200 according to the degree of dilution, then divide the product by the number of squares taken, and the result gives the number of colored blood-corpuscles contained in a cubic m. m. of blood.

Soon after blood is shed, the colored corpuscles become adhered to each other at their broader surfaces forming rouleaux, or rolls.

The extent and rapidity with which this peculiar form of massing of the colored corpuscles takes place varies, apparently, according to the amount of fibrin present—the greater the amount of the latter the sooner and more rapidly will rouleaux be formed. The cause ofthis phenomenon is not yet accurately determined. After a short time, under ordinary conditions, the cells lose the roll-formation, and become more or less separated from each other.

The adult colored blood-corpuscles of the mammalia (with the exception of the camel family), have no nuclei. This is not true in very early life, and in some forms of anæmia, when a nucleus is observed in many of the colored corpuscles.

The presence or absence of a cell-wall is still a matter of dispute, although I believe the weight of authority is now in favor of considering the colored blood-corpuscle as consisting simply of a pale, transparent, plastic, and homogeneous stroma charged with coloring matter, or haemoglobin.

The colorless, or so-called "white" blood-cells are not peculiar to the blood, as their origin is the lymphoid

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tissues, from which they pass into the lymphatic circulation, and then into the blood. They are also called "leucocytes," "lymph-corpuscles," "lymphoid-cells," "leucoblasts," "amoeboid," or "wandering cells," and are nearly similar in structure to—though differing in function from—the pus corpuscle.

Two chief varieties of the colorless blood-corpuscle, are found in normal human blood; namely, the granular and the paler, less granular variety. Ehrlich describes five varieties of colorless blood-corpuscles, and Prudden relies upon the determination of an increase in number of one variety or another, in diagnosticating the various morbid conditions accompanied by, or dependent upon, leucocytic hyperplasia.

There is a great diversity of shape, size and structure of these cells; much more so, in fact, than is the case with the colored cells. In every instance they are composed of living matter, or differentiated protoplasm, or "bioplasm," (Beale), or "bioplasson" (Heitzmann).

The active living matter of the colorless blood-corpuscle is arranged in a more or less well-defined and compact, delicate net-work, or reticulum. The appearance of the material composing these cells is liable to great variations, and, to the experienced eye, offers a very certain index to the general condition of the person from whom it came. In the healthy, strong, and robust constitution, these colorless corpuscles are comparatively small, the reticulation very slightly, if at all, perceptible, no nucleus is visible, usually, and the active living matter, or bioplasm, is very bright and highly refractive. On the other hand, in one of these corpuscles taken from a person broken down in health, or after long and wasting sickness, the

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cell is large, finely granular, one or more nuclei are present, the cell contains a greater or less number of vacuoles, and the living matter presents a dull lustreless appearance, very little refractive, and presenting a picture vastly different from the one first drawn. Between the two there are many grades, or conditions, depending, apparently, upon the general condition of the individual from whom they were taken.

The average size of the colorless blood-corpuscle is usually given as 1-2500 of an inch.

To be sure, my work in this line has not as yet been very extensive, but in the considerable number of specimens which I have thus far investigated, in every instance have I been enabled to form an intelligent opinion of the constitutional condition of the patient. and in selecting cases to examine, in order to verify this theory, (which is not at all my own), I have been uniformly successful in demonstrating the apparent relation between the person's condition and the appearance of the protoplasm of the colorless blood-corpuscles.

The theory has been advanced that the activity displayed by the colorless blood-corpuscles on a properly warmed stage, and surrounded by an appropriate medium, would indicate, more or less accurately, the vitality of the individual ;—that the greater the vitality of the person, the more active the movements of the leucocyte. As so many conditions, such as pressure, electricity, temperature and probably bacterial ptomaines, etc., affect the cell, an intelligent opinion can not be formed from these premises.

The relative number of the colorless to the colored blood corpuscles in healthy human blood is about 1.350, although this is liable to great variation in different individuals, and

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in the same person at different times of the 24 hours;—the proportion of leucocytes being greater during digestion, and less during periods of fasting. The number of the colorless blood-corpuscles is determined by the use of the Thoma-Zeiss apparatus already described. Instead of diluting the blood with the salt solution, as in the case of counting the colored corpuscles, Thoma dilutes the blood with water containing ⅓ per cent. sol. glacial acetic acid in the proportion of 1 to 10. In this way the colored corpuscles are destroyed, and the leucocytes alone remain in the field of vision.

The colorless blood-corpuscle usually contains a single nucleus, though rarely, this is multiple. The nucleus may or may not be visible. The addition of acetic acid has the same effect on this cell that it has on all other nucleated cells of the body,—namely that of making the nucleus prominent.

The action of the colorless blood-cell seems to be twofold. Aside from being a reserve of active protoplasm, to be called upon to repair the normal waste of the body, as well as the destructive processes of disease, certain of these corpuscles, *i. e.* the *phagocytes* of Metschnikoff, seem to have an especially aggressive action against offending foreign substances, including possibly a successful combat with pathogenic microbes.

BLOOD-PLATELETS.

The blood-platelets, first described by Bizozzero, are small, irregular, more or less refractive masses of protoplasm, the nature of which is still a matter of dispute. They are very unstable, tend to disintegrate, and vary in

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size, having an average diameter of about one-third that of the colored blood-corpuscle.

Heitzmann believes that the blood-platelets are offshoots from the colored corpuscle, and that their presence, to any extent, is evidence of a below-par condition of the individual. So far as I have studied this matter I am inclined to agree with this observer.

Certain it is that one may see, in many a specimen of fresh blood, without the addition of any reagent, the separation from the colored corpuscles of little masses of protoplasm, which, when entirely divided from the parent-cell, and after parting with their color, present every peculiarity to, and are, apparently identical with Bizozzero's blood-platelets. Then too, in those cases in which the structure of the colorless blood-corpuscle was such as to indicate a condition of the individual below the average of health, I have observed an increase of these platelets.

The identity of these bodies with the so-called "microcytes," or "small haemoglobin-containing elements," found in many morbid states, is suggested. The greatest difference between the latter and the platelets, aside from that of size, is the presence of haemoglobin in the former, and yet the fragment, I have mentioned, which separates from the colored corpuscle, very soon parts with its haemoglobin after complete isolation from that of the cell.

In cases approaching death, the exceedingly rapid formation of these bodies can often—if not always—be seen, as I have demonstrated to one of our fellow members.

According to Halliburton, the blood-platelets, or tablets, are found only in the blood of mammals. Gibson believes that these blood-plates which he calls *colorless microcytes*, are derived from the nucleus of young red blood-

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cells, or, occasionally, from the nucleus of white corpuscles.

The nature of these small blood elements is so little understood, that I am not aware that any considerable pathological significance has heretofore been attached to them.

HAEMOGLOBIN.

Haemoglobin is a crystallizable body which forms by far the greatest part of the colored blood-corpuscles. It is intimately distributed throughout the stroma of the cell, and must be dissolved out before it will undergo crystallization. Its most interesting properties are its power of crystallizing, and its attraction for oxygen and other gases. The haemoglobin of human blood crystallizes with difficulty.

The determination of the amount of haemoglobin, or blood coloring matter, is easily, and fairly satisfactorily obtained by the use of this instrument—Von Fleischel's Haemometer. The application of this instrument depends upon the principle that the color of the blood, diluted with water, may be compared with that of a glass wedge tinted with Cassius's golden-purple, or some pigment. Its essential part is the red glass wedge, which is mounted movably beneath a platform like that of a microscope, with a circular opening in its center. Upon this the light from a gas or oil lamp (daylight cannot be used) is projected, by a plate of plaster of Paris. Above the wedge, and exactly over the circular opening in the platform, is fixed a metallic tube 1.5 ctm. long, closed at the bottom with a plate of glass, and divided by a vertical metallic partition, so that one half of the metallic tube receives its

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light through the red glass wedge, the other directly from the white reflector. When the apparatus is in use, the former of these compartments is filled with pure water, the other with water mixed with a known quantity of blood.

To secure this known quantity, Von Fleischel has designed an automatic blood-pipette, of such a capacity that, when healthy blood is used, the resulting mixture corresponds in color to that derived from the part of the red glass wedge which is marked 100. From this point to its sharp edge (where 0 stands) the wedge is graduated in 10 divisions which represent its diminishing thickness, the numbers 90, 80, etc., being marked on the apparatus. The instrument is employed thus: The blood is obtained from a puncture in the finger, and placed by means of the pipette in the proper compartment of the tube. Both compartments are then filled with water, and the red glass wedge is moved until the two fluids show an equal intensity of red color. The number indicated on the scale is then read off.

Suppose this should be 80, then the blood examined contains but 80 per cent of the normal proportion of haemoglobin, or the quantity of haemoglobin to that of healthy blood is as 80.100.

The instrument is not an expensive one, can easily be obtained, and is of very practical utility.

SPECTROSCOPE.

The presence of haemoglobin, or of one of its derivatives can be positively detected by the use of the spectroscope *only* by an expert manipulator with this instrument, and I therefore will not dwell on this method for the detection of blood-coloring matter.

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GUAIACUM TEST.

In applying this test for blood-coloring matter, a drop of the blood solution (or a solution of a suspected stain,) placed over a white surface, or in a porcelain dish, is first treated with a drop of fresh tincture of gum guaiac, and then a drop of ozonic ether added, when, even if only a trace of the coloring matter of the blood be present, a blue color will immediately, or very quickly, appear. A drop of 1 to 1000th sol. of blood will thus immediately yield a decided blue coloration; and a 1 to 5000th sol. a quite distinct reaction. If on a white fabric, the test may be applied directly to the stain, by first moistening the latter with a drop of water, before the addition of the guaiac. This test will react even with very old stains, provided they are first well moistened with water; and even when the stains have been washed, evidence of their nature may be obtained.

HAEMIN TEST.

When the blood is in solution, a drop of the liquid is evaporated to dryness on a thin glass-slide, or in a watch-glass, the residue scraped together and pulverized, a trace of finely powdered salt added, and then a drop or two of glacial acetic acid. The heat of a small flame of a spirit lamp is now applied to the mixture, first around and slightly beyond the edges of the disposed liquid, until it has collected beyond the edges of the slide in the form of a globule. This is then heated until bubbles of gas appear and the liquid acquires a reddish-brown color, when the heat is gradually withdrawn until only a minute portion of

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liquid remains, this being allowed to evaporate by the heat of the slide.

The residue thus obtained usually consists of brownish-red lines or stains, more or less curved or circular in form. Under the microscope the haemin will appear as minute crystals, of a yellowish, reddish or brown color, more or less transparent, and frequently arranged in the form of stellate groups. When from only a minute quantity of blood, the crystals are single, and usually range in size from 1-1200th to 1-1800 of an inch in length, and from 1-6000th to 1-12000th of an inch in width.

With care, crystals may be obtained from even the 1-10000th of a grain of blood.

Regarding the relative merits of the two tests just described, Prof. Wormley, in answer to an inquiry made some time since, writes me:—"I think it possible to have an old blood stain from which a certain maceration in water would fail to yield sufficient coloring matter to the fluid to react with the Guaiacum test, and yet the same stain under proper treatment, might yield satisfactory results under the Haemin test. If the Guaiacum reagents are in proper condition, this test would, I think, give a positive reaction with a more minute quantity of blood-coloring matter *when in solution*, than, perhaps, any of the other chemical tests used for this purpose."

I would submit the following propositions in summarizing:—

First—The medical expert can not state positively that a certain stain has been made by human blood.

Second—It can not be stated that a certain blood-stain was *not* made by the blood of any one of the lower animals, except the sheep and goat.

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Third—That in measuring the blood-corpuscles at least 300 or 400 should be used in the determination.

Fourth—It is possible to determine that a given stain is of mammalian blood, (excepting that of the camel family.)

Fifth—If the witness is able to say that "stains are of mammalian blood and that the diameters of the corpuscles are consistent with human blood," and if he expressly states that they may be of other blood, he is giving testimony which will doubtless be accorded the weight to which it is entitled, and which cannot be effectively contradicted by the defence. (Hamilton).

When I first began preparing this paper, it was my intention to treat my subject more exhaustively, but almost before a good introduction is reached, I find the time usually considered requisite for the president's address, consumed. The field which I have entered is a large and fertile one, and, I assure you, a rich harvest indeed awaits the patient laborer in its domain. To at all properly consider the subject of clinical blood-examination would require two papers, and it was the cognizance of this fact that led me to select the title of the present address.

I had hoped to be able to bring to your notice many valuable facts in connection with this subject, such as the condition of the blood in malaria, in appendicitis, anaemia, chlorosis, etc., etc., but time forbids. I might say, by way of parenthesis, that differential diagnoses between appendicitis and typhoid fever are being made in some of our hospitals, entirely by blood-examinations.

I am afraid it is often the case that many medical men look at the assertions and suggestions of a microscopist with more or less incredulity. That there has been some

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excuse for such skepticism, in the immoderate claims made by some over-zealous and unscrupulous investigators, I admit, but I also insist that I have an abiding faith in my ability to convince the rankest unbeliever, by an hour's laboratory communication with him, of the great clinical value of an intelligent microscopical examination of the blood.

(I will now exhibit a few lantern slides of drawings made from preparations of blood demonstrating some of the points suggested in my paper. See below.)

263 So. Union St.
Burlington, Vt., Sept. 1895.

Note.—Reference to the following works has been made in the preparation of this address:

Clinical Diagnosis—von Jaksch.
Microscopical Morphology—Heitzmann.
System of Legal Medicine—Hamilton and others.
Micro-chemistry of Poisons—Wormley.
Normal Histology—Piersol.
Kirk's Handbook of Physiology, 13th edition.
Landois & Sterling's Physiology.
Text-book of Chemical Physiology and Pathology—Halliburton.
Pathological Anatomy and Histology—Delafield & Prudden.

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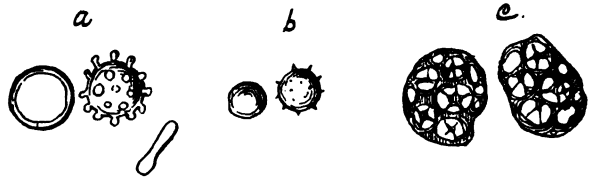
SOME BLOOD CORPUSCLES.

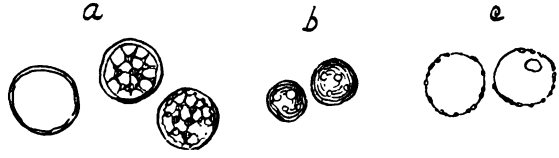
I



Fresh blood of Dr. A. D. W. kept in a moist chamber.

a—Colored corpuscles, smooth, crenated and on edge.
b—Haematoblasts, smooth and slightly thorny.
c—Colorless corpuscles—in amoeboid change—*no platelets.*

II



Fresh blood Dr. W. kept in moist chamber 48 hours.

a—Colored blood cells—hydopic—showing reticulation after extraction of haemoglobin by its own serum.
b—Haematoblates ; vacuolated.
c—*Ghosts* of colored blood cells.

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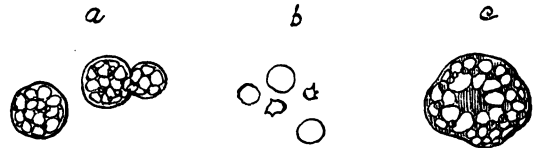
III



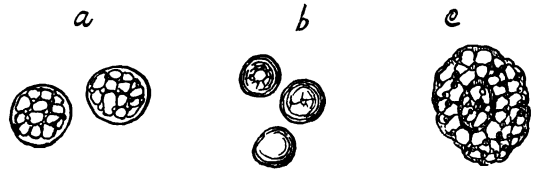
Fresh acid urine of Mrs. J. L. S. kept over night.

a—Colored blood cells—distinctly reticulated, partly budding, haemoglobin extracted.

b—Blood platelets.

c—Pus corpuscle.

IV



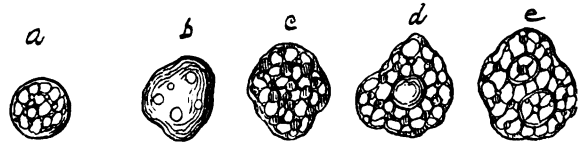
Sediment acid urine from haemorrhaic pyelitis due to calcium oxalate calculus, fixed with 1-5 of 1 per cent. chromic acid and preserved for 10 years in glycerin.

a—Colored corpuscle—distinctly reticulated.

b—Haematoblasts—abundant.

c—Pus corpuscles (poor constitution).

V



Fresh acid urine of Mrs. L. J. H. (Speec. grav. 124) kept over night.

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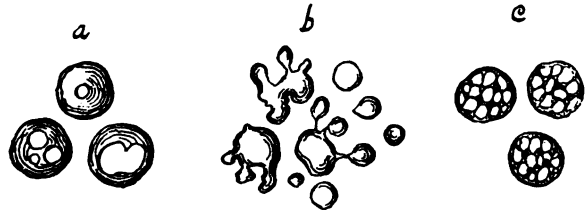
a—Colored blood cell.
b—Pus corpuscles of excellent constitution (scarce).
c—Pus corpuscles of good constitution.
d—Pus corpuscles of middling constitution.
e—Pus corpuscles of poor constitution.

VI



Fresh blood of J. H. L. in moist chamber mixed with a 50 per cent. sol. (saturated) of bichlorate of potassium.
a—Vacuolation of colored corpuscles.
b—Crenation and formation of platelets.
c—Reticulation of colored blood corpuscles.

DISCUSSION.

Dr. Wm. H. Porter: Mr. President and Gentlemen of the Vermont State Medical Society:—I hardly think it would be possible for me to add anything to what has already been said concerning the examination of the blood. All I can do is to give my testimony in the same line.

I am surprised, I must confess, to hear that anyone believes at the present day that they can analyze blood stains with any degree of accuracy. It is not possible to be sure that it is blood stains, even by the presence of what appear to be corpuscles, and I cannot see how any-

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one would be willing to swear that he had blood stains with only one point in evidence, without the other two points in evidence. In a general way, they might very easily think it was blood, but where the life of an individual is in question, I should think they would hesitate before giving a positive opinion. In a case of that kind, the individual should most certainly have the benefit of the doubt.

While it is generally recognized that we can diagnosticate the corpuscles of the different kinds of animals by the use of proper instruments, taking plenty of fresh blood, it is not possible when the blood is dry and the corpuscles have become more or less contracted, to say that the blood is that of a man, or even that of one of the lower animals whose blood so closely resembles that of man.

I must say that I agree most emphatically with Dr. Linsley that we are unable to give any definite analysis of the blood at the present time.

Dr. J. Henry Jackson: Mr. President and Gentlemen:—"I wish to say just a word to correct an impression and relieve anxiety on the part of Dr. Porter; that is, that the examination to which Dr. Linsley referred in his very excellent paper—in a case where it was declared that the examination of the blood could be so accurately made as to determine positively that it was human blood,—if I understand the doctor, was made in 1875, or about twenty years ago, and so need not give the doctor any apprehension as to the reliability of the expert of to-day in regard to determining whether a given stain be blood or not.

I have been listening very interestedly to the presentation of this subject by Dr. Linsley, and I think it will leave us with a better impression without further remarks

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from me. The logical and physical examination and appearances of the blood have been clearly brought out in the doctor's paper, and nothing I can say in regard to the subject will improve your understanding of it.

I wish to thank Dr. Linsley for his very excellent representation of this work."

Dr. J. N. Jenne : "Mr. President and Gentlemen :— I have been very greatly interested in this paper so ably presented by our President and I wish to consume but a moment's time in the matter of its discussion. However, there is one point which has been raised here, and that particularly with reference to the value of the result of the examination of the blood. After there has been a thorough chemical analysis and microscopic examination, one should then be able to meet the question as it appears in medical and legal cases.

I assume that it is not necessary in any instance for the expert who is called, to inquire into the circumstances presented to him by the officers of the state, and as a matter of fact it is not often that he is called upon to state that the stain is the blood of any special animal. He certainly should not, in our present state of knowledge presume to be able to determine that the stain is the blood of any specific animal ; but having undertaken to do it, he is in duty bound to apply all the knowledge as far as possible to determine.

The statements with reference to the value of a microscopical examination, and the fact of finding whether the corpuscles were present, and the opinion given that it was blood or otherwise, were made with reference to that examination alone without reference to any other examination. I can conceive how an examination made in that

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manner might lead to the results stated in the doctor's paper; but taking a given stain and applying the Guaiac test, or any other chemical test, or both, and having got the reactions which are characteristic of the presence of blood and demonstrative the haematin crystals, and verifying this by finding the corpuscles, if skillful enough by spectroscopic test, then one can say that the specimen is blood; and further examining the specimen with the microscope and finding corpuscles that correspond with any given species, he may state what his examination has evinced.

I do not mean that any blood can be submitted to these tests and determined to be the blood of the exact animal from which it was taken; but with proper instruments, you can determine that it is not the blood of certain animals. It is possible that the test may be applied and no reaction given by any one of the tests whereby you could say that the stain was blood. These same conditions could be present in any old stain, as age and other circumstances connected with blood drying, and treatment in the redissolving of the corpuscles, may destroy them, that is, change their diameter so that it would, under these circumstances, be absolutely impossible by these tests to determine the fact of blood, further than that it was mammalian or otherwise, and you would be able to declare it the blood of a given species. It is certain then that the spectroscopic tests can be made and will generally reveal the presence of hæmatin crystals, and if the hæmatin crystals of Zieshman, so-called, did not show, and the conditions that destroyed the corpuscles were present, it would then be impossible to say that a given stain was blood. So that in a given specimen, if the hæmatin

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crystals are found and demonstrated and the corpuscles are dried so they can be redissolved, then there is no need of applying other chemical tests; but by a failure of the above, the spectroscopic test should be used, and if blood were present you would get the characteristic reaction. Having tried these tests and further examined with the microscope for the corpuscles, if they have not so far degenerated that they cannot be recognized, he may state with a degree of certainty that they are blood stains, being human, or dog, or any other animal whose corpuscles are about the diameter of the human blood corpuscles.

With reference to the determination of the corpuscles of fish and reptiles, it seems to me that unless the corpuscles have been subjected to some severe exposure or to long continued soaking in water or other liquid, they should be always recognized; that an expert may state with a degree of certainty that they are not man's. With reference to the conclusion that should be drawn from the corpuscles of man alone, it seems to me that in fresh blood —blood freshly drawn from the animal—it would be safe, having made careful examination—having been shown that it was blood, and fully satisfied that the conditions confirm the opinion that they were fresh, such as change of contour or lateral diameter—it seems to me that a different opinion could be given from that narrowly drawn limit stated in the doctor's paper.

I find on the perusal of recent authorities that corpuscles measuring less than one four-thousandths of an inch in diameter may be stated fearlessly to be not those of man or any of the animals whose blood closely resembles that of man; but if not positive as to the exact diameter,

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it would be much safer to state simply that they resembled the human corpuscles.''

Dr. G. B. Bullard: "Mr. President and Gentlemen:—I do not recognize anything particularly familiar in Dr. Linsley's nice showing and I want Dr. Linsley to tell me, if he will, what I shall use and what I shall do—how I can be positive with reference to recognizing the tubercle bacillus.

I was very glad to hear Dr. Linsley say that you should use artificial light, as I have become convinced that a man must have artificial light and have it exactly as Dr. Linsley says in order to see clearly, and especially so since my eye-sight got so poor. But I would like to know how I can be sure of tubercular microbes. What kind of a lens shall I use; will a one-fifth lens do?

Dr. J. H. Linsley: "There is, arising almost every day, the question of detecting blood corpuscles—it is probably attempted to be done in every State in the Union. I have myself been called upon to do this very same thing. I was given an implement to determine whether there was any blood on it. I examined it carefully and found a number of places where I thought there were blood corpuscles of thirty-eight hundredths of an inch in diameter. I examined three or four days and found more corpuscles. In the meantime the stains found would not react with the hematin test. They were not colored particularly. I then wrote to Prof. Wormley asking if it would be possible to have so small a quantity of blood, the corpuscles be present and yet not be able to get the reaction from the Guaiacum test. He said he believed it was. I was not satisfied with that; I then examined a number of other spots until I finally found one that gave the reaction. Even

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then, I could not say that these corpuscles were of the human blood, all I could say was that they were consistent with the human corpuscles.

Now, I must beg leave to differ with Dr. Jenne in regard to the statement that all corpuscles smaller than one-four thousandths of an inch must be of dog or man or some animal of that class; and I think I can demonstrate to his satisfaction a given field of at least twenty corpuscles, where one-third were of less diameter than normal. Now, if that is the case, can you say that that blood is not from man?

I have spent the last year in more or less constant work on this subject, and I must say that I started with a very different idea of the blood than I now have, and the conclusion I have come to is that the more I work on the subject the less I am able to do with it.

In reply to Dr. Sherwin, I would say as to the condition of the blood corpuscles as described by him, that in some conditions, the corpuscles do certainly break up; but I supposed it was just before death where the blood split up very rapidly, —in this particular case I can't explain it, there might have been something as to the condition of the finger that was not quite proper before the puncture was made.

To determine tubercular bacilli, the use of the carbon fixing fluids and the coloring with methaline blue is the most simple. The tubercle would be blue and the ground light. The best lens for this use is the one-twelfth, but you can use the one-fifth.

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Vice-President's Address.

CHRONIC GASTRITIS.

By F. F. Chaffee, M. D., Hartford.

Mr. President and Gentlemen of the Vermont State Medical Society :

The general practitioner, the busy plodder in medicine, may, I believe, find his most profitable and practical field of study in his every day work. He is not and from the very nature of his work he cannot be a pioneer to explore new and unheard of realms in the domain of science. He may more safely take Sidney's maxim, "Look in thy heart and write." It is not often his to lead but to follow; and if he but follow safely and well he need not care if he sometimes finds the path well trodden before him. It is with some such thought as this that I venture to select for my theme, what may perhaps be deemed a commonplace topic, Chronic Gastritis.

It seems to me, however, that several reasons lend much more than ordinary importance to this subject. First, the very great frequency of the disorder and the fact (for I believe it to be a fact) that the disease is so often imperfectly diagnosticated. We hear far too much of the terms indigestion, chronic dyspepsia, etc., or at least too much

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misuse of them, employed in a sense as vague, indefinite, unscientific and conveying about as little pathological meaning as did the old use of the term "Dropsy." Second, the profound effects of the disease upon the whole being of the afflicted individual, physically, mentally, morally,—mal-nutrition with its horde of resulting evils and dangers. The physical suffering entailed is fitly accompanied by a train of mental disturbances, altogether forming a picture only too often seen in the victim of so-called chronic dyspepsia. I have often wondered if Thomas Carlyle, that fretful, fault-finding, petulant prince of pessimists, did not draw much of his inspiration from his stomach. It is related that at the age of 23 he became afflicted with what was called dyspepsia. What a description he himself gives of his experiences and mental suffering from gastric disorder:

"I entered my chamber and closed the door, and around me there came a trooping throng of phantoms dire, from the depths of nethermost perdition. Doubt, fear, unbelief, mockery and suffering were there and I wrestled with them in an agony of spirit. Thus it was for weeks, whether I ate I know not, whether I drunk I know not, but I know that when I came forth again it was with the direful persuasion that I was the miserable owner of a diabolical arrangement called a stomach. The accursed hag, dyspepsia, had got me bitted and bridled, and was ever striving to make my living, waking day, a thing of ghastly night-mare."

And now, gentlemen, trusting you will not deem the subject of my theme wholly unimportant and unprofitable, I will endeavor to call your attention to some of the more

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practical points pertaining to the subject already mentioned, viz : chronic gastritis.

ETIOLOGY.

The causes of chronic gastritis are many. Perhaps it most frequently results from the acute or sub-acute forms, for frequently they all originate from a common cause. Whenever the normal action of the liver and spleen are interfered with or the heart's action becomes abnormal there seems to be a greater liability of this disease.

Among the conditions that predispose to chronic gastritis by an altered condition of the blood, eminent authorities place the following diseases as most active, viz : chlorosis, scrofula, anemia, typhus and typhoid fever, acute exanthemeta, pregnancy, uterine diseases, diabetes, gout, and chronic affections of the kidneys. The disease not infrequently results from direct local irritation, either from irritating substances brought in contact with the gastric mucuous membrane, or by toxic substances in the blood, brought in contact through the medium of the circulation. The American "quick lunch" may be mentioned as an example of the first, i. e. bolting large morsels of insufficiently masticated and insalivated food, and washing them down with half a glass of ice water, or perhaps some more objectionable fluid, thereby unduly cooling the stomach and diluting the digestive fluids to such an extent as to render them practically inactive for a considerable time, and making the conditions favorable for fermentation to follow. The abuse of alcohol either by direct contact, or through its action on the liver, no doubt often proves an exciting cause, but I have not found the diseases more common

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among "drinkers" than with the more abstemious. Other factors which deserve more than a passing notice are the swallowing of tobacco juice, putrefaction from carious teeth, ulcerated gums, the prolonged use of irritating condiments (and as most condiments are more or less irritating they should nearly all come in this category), toxic substances which circulate in the blood as seen in chronic renal disease and the products of intestinal putrefaction in obstinate constipation. It will be observed from this recitation of the predisposing and exciting causes that it is usually through the indulgence, or sufferance of the patient that this disease is born.

As a noted German writer says: "Most persons treat their stomachs badly, and are able neither to resist culinary temptations, nor to take sufficient precautions at the beginning of their trouble, consequently chronic stomach catarrh is one of the best nourished and most prevalent diseases in the world. Indigestion is the remorse of a guilty stomach."

CLINICAL HISTORY.

Ewald divides the disease into two forms clinically, viz: chronic simple gastritis and chronic mucous gastritis, both of which may lead to atrophy of the mucous membrane, if left to pursue their natural course. Early in the course of the disease the symptoms of both forms are so nearly identical that the differentiation is difficult and at times even impossible without the new method of examination. Common to all are the symptoms of chronic dyspepsia, and these may continue for a long time without much variation before the characteristic symptoms of atro-

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phy present themselves with sufficient prominence to be recognized. A constant symptom is tenderness upon pressure over the epigastrium, not extreme, but invariably present. The tongue is coated and lacks its normal moisture. The coating has nothing characteristic but varies much in its appearance from morning till night. The covering is thickest at the base and varies much in color. The tongue is enlarged and has impressions of the teeth on the sides, with frequent thrush-like spots which are usually extremely sensitive. The breath usually has a fœtid odor. There is frequent and often profuse eructation of foul gases from the stomach, often accompanied by acrid fluid which imparts a burning sensation to the œsophagus and throat. If limited to the lower extremity cardialgia may produce urgent symptoms and may be mistaken for the more diffuse pain of gastralgia. The acidity of the regurgitated fluids is said to result either from fermentation, in which case they contain acetic, lactic and fatty acids, or from an excess of hydrochloric acid. If these symptoms are prolonged and are not amenable to treatment, an analysis of the stomach contents is sometimes necessary, in order to ascertain whether the former or latter condition prevails, as good authorities claim the same sensation may be present, and caused by a hypersensitive condtion of the mucous membrane, being irritated by normal gastric fluid. Vomiting in the early stages of the disease occurs in less than half the cases, while slight and transient nausea is a pretty constant symptom. The appetite is capricious. Often a small amount of food produces a sensation of fullness, and belching of gas almost immediately ensues, while in other cases, the sensation of a stone in the stomach begins almost with the first act of digestion, and

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continues for hours, or until all the food has been forced from the stomach. The production of gas usually begins as soon as the meal is completed, and continues until long after all food has been expelled into the small intestine. The excessive formation of this gas is thought to be a very important factor in the production of gastrectasis, or stomach dilitation, by paralyzing the muscular fibers. In many cases thirst is extreme, but not usually. Cold drinks frequently cause much gastric distress, and as I have noted in three cases, frontal headache would almost immediately follow the taking of a tumbler of ice water. The bowels usually retain their tone for a long time, but eventually constipation and diarrhœa alternate and, when the compensatory action of the intestines is exhausted, the food passes almost unchanged through both stomach and bowels, accompanied by a profuse discharge of watery fluid, frequently containing a large amount of mucous. Then it is that the system begins to suffer profoundly from malnutrition, and is particularly susceptible to invasion by other diseases. The urine is scanty and of high specific gravity and is often very irritating to the mucous membrane of the bladder, causing frequent micturition and sometimes tenesmus. The patient is disinclined to any active exercise, and suffers from exhaustion upon the slightest effort. The mind usually keeps pace with the body, the patient eventually becoming depressed in spirit, much inclined to sleep, and seemingly never thoroughly aroused. The symptoms are intensified whenever a full meal is taken. Pharyngeal and nasal catarrh are nearly always present, the heart's action is weak, and the extremities are cold, and itching of the skin and frequently urticaria are present. Ewald describes a variety of dys-

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peptic asthma which is rather rare, and Rosenbach has published an article on cardiac dyspepsia, in which nearly all the symptoms are referable to the erratic action of the heart, while Trosseau described a gastric vertigo, which is quite common in cases of long standing gastritis. The patient after taking a full meal is seized with vertigo, and is frequently apprehensive of impending danger, is unwilling to be left alone, even for a minute. Usually the departure of the vertigo is followed by a severe headache. One case under my care was unable for several months to take a full meal without the occurence of vertigo, and experiencing a sensation, which he described as similar to that following a stunning blow on top of his head. Among the later symptoms of the disease are those produced by atrophy of the mucous membrane, when instead of areas of greater or smaller size, the whole membrane becomes involved, and compensatory action of the intestines becomes exhausted, as it must eventually be, then the effect upon the system becomes most marked, and the patient loses rapidly in weight and strength, and soon succumbs to the disease itself, or falls an easy prey to some intercurrent disease. The final symptoms of chronic gastritis bear such a striking resemblance to those of pernicious anemia, that it is held by some that the latter is not an independent disease, but the result of anemia of the stomach.

DIAGNOSIS.

Perhaps no disease offers more difficulties to the diagnostician, than chronic gastritis. An absolute diagnosis is often impossible without a chemical examination of the stomach contents, either while fasting or after a test break-

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fast. It requires not so much skill to determine that the stomach is the seat of disease, as to differentiate this disease from many other undeveloped diseases of the stomach. Of the many diseases which may simulate chronic gastritis in their symptoms, perhaps none are more apt to mislead than the neuroses.

The age of the patient will give us some evidence on this point, as nervous dyspepsia is a disease nearly always confined to the young or middle-aged. In differentiating between chronic gastritis, and carcinoma of the stomach, Ewald lays much stress on one symptom, viz: the bloody color of the stomach contents in the latter disease, due to the presence of blood pigment, which he thinks is almost invariably observed, even when hæmatemesis has not occurred; he says, however, that the diagnosis of a true gastritis can be reached only by exclusion i. e. after ulcer, carcinoma, dilatation and the neuroses are thrown out, then the residue so to speak is gastritis. Of the chemical and microscopical examinations, the following results are accepted as indicating the different forms of this disease. In simple chronic gastritis while fasting, the stomach only contains a small quantity of watery mucous fluid, frequently tinged yellow, or yellowish green, from mixture of bile. On standing a sediment of epithelial cells, round cells, and free nuclei, remnants of food, starch granules, muscle fibrilae, and vegetable cellular tissues, is found.

After a test breakfast the acidity is variable, but never increased, hydrochloric acid lessened, pepsin and rennet small in amount. In chronic mucous gastritis there is an abundance of mucus in the stomach contents, either while fasting or after taking food, so that acetic acid always gives a marked mucin reaction.

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Trial digestion (in test tube) occurs only after adding hydrochloric acid, and then is slow, curdling by rennet slow, or absent, wash water after lavage contains small, frequently bloody fragments of the epithelial mucous membrane.

When atrophy has occurred the stomach while fasting is found to be empty, and the chyme expressed after test breakfast contains neither mucus, hydrochloric acid, pepsin nor rennet, and no tissue elements of the glandular parenchyma are to be found in a totally atrophied stomach.

Although these methods of diagnosis may seem like an innovation to the general practitioner, they are neither complicated nor difficult, and should be resorted to whenever an accurate diagnosis cannot be reached in any other way, as the success or failure of treatment depends as much upon the accuracy of diagnosis as upon the remedies employed ; what might be serviceable in the first form, would as likely prove ineffective in the third, and vice versa.

Again, the sooner a diagnosis is made out, the greater the probability of relief or cure.

Hence when such a case presents itself to us, no means within our reach should be neglected, as it may mean a complete restoration to health of our patient.

PROGNOSIS.

The prognosis depends upon the age, general condition, and moral stamina of the patient, as well as upon the form or progress of the disease. In simple chronic gastritis, or chronic mucous gastritis, when un complicated and the patient found willing and capable of co-operating

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with us, a cure can be promised in a great majority of cases, but the patient must be made to understand that as much depends upon his behavior, as upon our skill.

When the stage has progressed to the stage of atrophy of the mucous membrane, the most that can be hoped for is relief for a longer or shorter time, depending upon the extent of the destruction of the mucous membrane, for when the case is not seen until the secretory function of stomach is suspended, the case is a short one at best, and nothing is left for us but palliation.

TREATMENT.

In no disease has there been a greater multiplicity of remedies recommended than in the one under consideration.

And what one author relies upon as his best and surest remedy, is merely mentioned as of doubtful efficacy by another of equal eminence and skill.

Ewald divides the remedies to be employed into three groups, viz: those which aim to directly replace the deficient gastric secretion, those which are to stimulate the depressed functions of the stomach, and those which are capable of counteracting the irritant substances introduced from without.

As there is always a diminished amount of hydrochloric acid in this disease, and as it plays so important a role in the process of digestion, not only by its direct action, as a digestive agent, but as an antiseptic, reducing to a minimum the ever-present tendency to fermentation, it is only rational and natural that we should place it foremost among our remedies.

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It should be given not too largely diluted and in full doses, each dose divided into three and given at intervals of twenty minutes, the first immediately after the completion of the meal,—the ordinary precautions for the protection of the teeth should of course be observed. The use of pepsin, so universally given on general principles in ordinary doses seems to have no good effect in the first two forms of this disease, and in larger doses the action is doubtful, but when general atrophy of the mucosa has taken place and no pepsin is present in the stomach, even after the administration of hydrochloric acid, then full doses (5 to 8 grains) may be relied upon to some extent. Next to hydrochloric acid as an antiseptic I have found the salicylates—either salicylate of bismuth or salicylate of sodium.

The former is the more soothing to the mucous membrane. The latter while possessing the anti-fermentative properties of the former, has the additional power of neutralizing the lactic and fatty acids usually present. Another remedy recently introduced is dermatol, which has given very satisfactory results.

It is best given in five grain doses, repeated every two or three hours, when the secretion of mucous is abundant or when vomiting is very troublesome, both of which it usually relieves after a few days' use. When these remedies have failed the administration of ten grain doses of inspissated ox gall, three times a day, directly after meals, has proved of value in two cases which recently came under my observation. Nux vomica and strychnine are valuable agents when the muscular fibres of the stomach have lost their tone, and there is a tendency to dilatation. Their combination with hydrochloric acid makes an admirable

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remedy in selected cases. Since the approved apparatus for washing out the stomach has simplified the process so much, lavage has come into more general use, and with the most gratifying results. It not only increases glandular activity, but detaches and removes masses of mucous and undigested and putrefied food, and frequently relieves gastric pain and distress which have resisted the most powerful anodynes. Usually clear warm water is first introduced, followed by alkaline solutions, if much mucus is present, or antiseptic solutions if indicated, leaving a small amount in the stomach after removing the tube. The introduction and removal of the tube are said to increase peristalsis and strengthen muscular activity. While Ewald, Jaworski, and Stuart speak of this remedy with positive assurance, other contemporary writers of eminence do not mention its use.

In atony of the stomach massage has been tried with good results. Enihorn's electrode is introduced into the stomach, which is nearly filled with water in order that the current may be more diffuse, the circuit being closed by a flat electrode over the epigastrium. Other measures directed to excite the stimulation of glandular secretion are the bitter tonics, of which quassia, gentian, columbo and condurango are the most active. Thompson attributes much virtue to columbo, while Ewald combined condurango with hydrochloric acid. Their modus operandi is not quite settled, Jaworski claiming they lessen the amount of secretion, while Marcone asserts they increase it, and third authority thinks their beneficial effect is due to their increasing peristalsis. However it is generally conceded that they have a stimulating effect on the digestion. Fowler's solution, nitrate of silver, ipecac, resorcin and bisulphite of carbon

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water all have their advocates, but with me they have been disappointing, and vastly inferior to the remedies before mentioned. Remedies for the relief of symptoms, more particularly pain and flatus, are sometimes necessary, and the most valuable of these so far as my observation goes are chloral, hydrocyanic acid, cocaine, codeine, and charcoal, although the last named is condemned in the strongest terms by modern writers as having no power to absorb gas. The administration of alkalis to allay the symptoms due to fermentation sometimes gives marked relief, but if long continued they depress the already weakened stomach and are objectionable for this reason. Active purgation is usually not well borne, but as constipation exists in a large majority of cases, it is necessary to stimulate the action of the bowels, and the old "Solomon Hypochondriacum" formula of Kliest most admirably answers this indication. It consists of pulverized rhubarb, 5 drachms, soda sulphate 2½ drachms, soda carbonate and soda bi-carbonate of each 75 grains, and may be given in teaspoonful doses at bed time.

Aloes and cascara sagrada, both of which act on the large intestine, are at times valuable, but while the former if long continued in sufficient doses to be effective acts as an irritant, the latter loses its effect after a time, and will need to be changed for something more active. Carlsbad salt may be given in moderate doses for a short time, with the most gratifying results, but according to Jaworski if continued for a longer time, it lessens gastric secretion, and even leads to atrophy of the glandular parenchyma.

There is no more important part of the treatment than that of regulating the diet, and as Ewald says, the regulation of the diet of a dyspeptic begins with the mouth.

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This part of the alimentary canal should be put and kept in good order.

The teeth should be kept scrupulonsly clean, resorting to the brush after each meal.

The gums should be kept in as good condition as possible, and every abrasion should receive prompt attention, false teeth should be removed and cleaned frequently, and kept in an aseptic solution during the night, mastication and insalivation should be thorough, and not a morsel swallowed until made liquid by mixture with the saliva. Everyone's stomach is a law unto itself, and what might be entirely indigestible and positively painful for one, might be well borne by another.

As a rule with comparatively few exceptions, pastries, fat, tough or freshly slaughtered meats, shell fish, fat fowls and new bread are to be discarded, also cabbage, beets, peas, and beans, cheese, vinegar, alcohol, except in rare cases, and then largely diluted, fats, oils, gravies, sweetened sauces, etc. As a substitute for meats, the peptones are very satisfactory. Mosquera's beef meal or jelly, beef peptonoids, Wyeth's beef juice, being very palatable, and easily assimilated and containing a high per cent. of nutrient principles.

Milk should be tried in every case, and is usually tolerated, if not relished, either raw, cooked, hot, or cold, sweet, or sour, with lime water or peptonized. Milk evaporated to dryness, and powdered as recommended, by Ewald, and added to some of the above preparations, adds much to their nourishing qualities.

After the stomach regains its tone to some extent, the white of soft boiled eggs may be allowed, also dry toast, and

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if these are tolerated stewed fruits may be added, and later a rare mutton chop.

But little if any drink should be allowed with the meals, but an hour after meals a warm drink will do no harm, and at times seems to stimulate digestion. The patient should be restrained from fully satisfying his appetite and the second meal should never be allowed until the stomach is entirely relieved of the first.

Moderate exercise should be insisted upon, the duration of such exercise to be governed by the patient's strength, rather than his inclination. The skin should be kept in good condition, by frequent bathing, and sufficient clothing worn to keep the extremities warm at all times. This may be supplemented by gymnastic exercises, and by friction should this fail. In no disease will cheerful surroundings and lively company accomplish more than in this, and they should receive consideration accordingly.

DISCUSSION.

Dr. H. R. Wilder: "Mr. President, and Gentlemen of the Vermont State Medical Society: I am under some embarrassment, inasmuch as the subject given me was an address in medicine—a very broad subject—one of which I was unable to think of anything special, either for your enlightenment or entertainment, consequently I made very little effort, not knowing what the subject of the paper was to be. Since listening to the paper, I have been very much interested in this special subject.

While I can say very little to add to the completeness of the paper, I might possibly say some things in an effort to magnify some of the statements in the address. It is a

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subject that we are all familiarly interested in, and perhaps more frequently than formerly, this disease of the stomach is so frequeutly denominated dyspepsia without the slightest attempt at any differential diagnosis being undertaken. We are, I admit, too apt to ignore the special causes of gastritis. I believe one of the principal causes is too free an ingestion of food. I believe there is no other organ of the body subjected to such maltreatment as the stomach. It is made the receptacle for almost everything that is any way desirable, regardless of its effect. Not only in the matter of drink, and not always the simple drinks either—those that nature provides us—although I do not believe that nature provides ice for us to fill our stomachs in the hot season of the year. While it may be all right to use it at the proper temperature, I do believe that ice water is injurious, especially as used by many—thoughtlessly and carelessly, because we do not realize its immediate effect; and so I might say as to the different kinds of food taken into the stomach. I believe that 9-10 of the laity consume a greater amount of food in 9-10 of their meals than the system requires, and in many instances much more than the stomach is able to take care of. I mean by taking care of it, that the food is properly digested. I do not mean the amount that a person may take into the stomach without experiencing any immediate effects that are bad, but I mean that is properly digested and assimilated by the body. To be sure, we are all very much inclined to indulge our bodies. Our cooks endeavor to make our foods as palatable as possible, and they are sometimes made so at the expense of our digestion. In those cases it is very necessary that the amount of food taken should be proportionate to the ability of the stomach to digest it.

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When we see the great liberty that men take in indulging the appetite and filling the stomach, it is no wonder that we see so much suffering from gastric difficulties. It is a wonder to me that we are not oftener called upon to treat gastritis. In mixing many kinds of food in the stomach, the gastric juice cannot properly digest it and we get as a result fermentation, which in a short time will produce chronic gastritis. I think if we were to strictly interdict the use of food, except so far as is prescribed by the physician, we should have greater success in our treatment. To be sure, there are remedies that aid in allaying these conditions of suffering, caused by indiscretions of diet, temporarily, but if the cause is repeated, how can we hope to make the cure? I think the real aim of our treatment should be in regulating the diet—not only of kind but quantity. While there are remedies essential and necessary to improve this condition of the stomach we should not forget that at best the relief obtained from them would be only temporary.

Under this subject, while it might not be considered strictly a germ disease, yet we get fermentation as a result of germs in the stomach and we get ptomaines as a result of fermentation. These are absorbed and effect the general condition of the blood. No doubt of that. The food, undigested, passing through the system tends to render the blood impure, and the system will suffer in many ways. I do not mean to say that there is any particular germ, or anything on that score that is the cause of all this trouble.

Dr. W. N. Bryant: Mr. President and Gentlemen:—We are usually interested in what interests us most personally, and the only possible excuse for my saying any-

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thing on this subject is my own personal interest in the matter.

It seems to me that I have sounded the heights and depths of this subject, and when I have not been experimenting on myself I have been on some other unfortunate mortal like all the rest of you, until they wished themselves out of the way, and I certainly seconded their wishes and was ready to seek "advice where all Wisdom lies."

There are a few practical points that I wish to magnify in speaking of this all too common affliction. It has come to be almost a standing scandal to the medical profession. It seems to me that a very large proportion of these cases are of neurotic origin, and I have come to believe that it is a result rather than a cause in neurotic patients. It has occurred to you, too, the very great influence that the mental condition exercises over the physical. For instance, if the mind be diverted by some temporary cause—if the patient go to some social place among cheerful, jolly people, he is apparently just as well as they are—can eat and digest as satisfactorily and is just as lively, while at home he has been in a melancholy frame of mind and could digest nothing properly. This, of course, is a pointer that we get, which I believe that while we cannot avail ourselves of it, does disclose these niceties in diagnosis and analysis. These cases divide themselves into two classes,—those that acids will relieve and those that alkalines will relieve, where we cannot keep the patient in retreats or sanitariums and experiment. In some cases acids increase this condition. And now, I believe, that with all the drugs that have been used, we should speak of treatment simply, together with the point that the doctor has made in regard to diet. From my experience and obser-

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vation, we get more practical use and practical good from washing the stomach with the syphon than with all the drugs we have.

In regard to the use of pepsins, which the doctor has spoken of, I give pepsin as a matter of routine, but I believe it is utterly useless. If pepsin is going to help the case at all, we must have pure pepsin and for a long time I have considered Parke, Davis & Co.'s aseptic pepsin as the best. Another point, in the administration of these things; we get very much better results in giving a part of the dose directly after eating, another portion in an hour, and another in another hour. In this way, I think very much more satisfactory results will be attained than in giving it all at once.

The reflex troubles are from fermentation, as a result of inactivity of the stomach. For myself, I never found a drug that satisfied these cases as well as hyposulphite soda, combined with whatever artificial digestive ferment. Some form of alkali—preferably any effervescent with the artificial ferment such as some of the preparations of pepsin or soda found in the market, will produce the best possible results that we can get.

Dr. F. C. Morgan: Mr. President and Gentlemen:—One remedy which I have used in this form of chronic dyspepsia where the mucous membrane was involved and which seemed to allay the disagreeable symptoms of the disease is listerine, given in one-half teaspoonful doses once every half hour or one teaspoonful half a dozen times a day. Many times I get a very good effect from it.

As far as the pepsin and soda are concerned, I have great confidence in that combination. It seems to work very nicely in a great many cases.

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Our Profession.

By W. D. Huntington, M. D., Rochester, Vt.

When Hippocrates proclaimed that however diseases may be regarded they must all be treated as subject to natural laws, he based his principles and practice on the theory of the existence of a spiritual restoring power, "Vis medicatrix naturæ," in the management of which the physician's art and science consisted and could only be obtained by experience. At this time, separating medicine from priest-craft, he originated the method of treatment of preserving the vital forces based upon principles which according to experience would not endanger the life of the patient. This was a period of great intellectual improvement and only needed a powerful mind to be brought to bear in this line of thought and research to inaugurate one of the most conservative of sciences. With progress so rapid the magnificent development which has been attained in all the branches of science reveals a vast amount of experimentation, observation, skill and mechanical ingenuity which has achieved results almost beyond the comprehension and knowledge of our profession of a few years ago.

Previous to the present century, knowledge of the structure of the human body was vague, while the theory

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of disease was known only by limited fancy, but as the great truth which established the connection of physiology, anatomy and pathology came to be recognized more fully, the morbid action better understood, the explanation of symptoms and following the rational treatment on scientific grounds, our knowledge of disease became better understood. The finger of science points steadily and the aim for a correct diagnosis should be the first duty of the physician. Many instruments have been called to our assistance which permit of a wider application of the senses, notably the probe, thermometer, stethoscope and microscope. With our present knowledge of disease the microscope stands first among our instruments of research. Since the investigations of Koch the advance in the knowledge of the relations of bacteria to disease has progressed with marvelous rapidity and our treatment at present is based on a thorough understanding of internal antiseptic medication.

Bounding with no less degree of energy is the humane and wonderful progress reached in other fields of our profession. Surgery, with its crude, agonizing and barbarous operations, was practised with painful apprehensions both by surgeon and patient. The artificial introduction of anæsthesia by the use of drugs, or the inhalation of vapors was a subject of great interest both historically and for its practical application for the relief of pain and suffering. There is abundant evidence to show its former application. Homer mentions the anæsthetic effect of nepenthe, a drug used by the ancients to relieve pain, to produce great exhilaration of spirits, while later, inhalations of a certain kind of hemp were used to produce intoxication, rendering the patient insensible during surgical operation. But the

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practice of anæsthetics had never become general, and surgeons had come to look upon them with despair, until 1846, when Dr. Morton, a dentist of Boston, successfully employed sulphuric ether to produce general anæsthesia. Owing to the researches of practical chemists and physicians of the present century, anæsthetics have come to hold a foremost place in medicine. Their discovery cannot be overpraised, and the work of the surgeon to-day is much relieved, while operations of the most delicate character are undertaken, and patients are spared an incalculable amount of suffering, and the dread of undergoing surgical operations is, in a great degree, mitigated by the knowledge that they can be performed while in a state of tranquil sleep. But not alone to anæsthetics are to be ascribed the grand results achieved in modern surgery. Can we be too hearty in our praise of asepsis and antisepsis? The stage of controversy and argument has passed, and antisepsis is acknowledged by the surgical world of to-day as a true and valuable method. Clinical and bacteriological proof has been produced which proves conclusively that suppuration, erysipelas and pyemia arise from pyrogenic organisms, while statistics of surgeons of the last two decades demonstrate that these septic diseases which were once so prevalent in private and hospital practice have nearly disappeared, and the treatment of fortifying tissues against the invasion of bacilli is considered the only means of successful surgery at the present time. To what cause can we attribute the brilliant results obtained in modern obstetrics? To what cause can we attribute the grand achievement in decreasing the death rate of lying-in hospitals? From what cause can we expect to obliterate purpureal fever? From the fact that clinical experience

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of the last score of years has demonstrated that obstetrics has kept pace with the ever advancing steps in the different branches of our profession, by the thorough study and application of listerism.

The beacon light of chemistry penetrating deeper and deeper into therapeutical products, displacing the more crude forms by determining a more satisfactory standard of medication, by agents capable of producing greater effect, administered with exactness through skill in modern therapeutics. With all the progressive changes taking place in the medical profession, can any one disbelieve in the evolution of science? Can we not see the fallacious teachings of Hippocrates as compared with the enlightened knowledge of drugs and methods of administering, when to-day their physiological action is definitely known?

There is no subject just now which requires more earnest consideration than that of State Medicine, which by its progressiveness and relations to public health, in preventing disease and preserving health, has been a constant and influential factor in elevating the standard of professional education. And the steadily diminishing mortality is due to increased medical knowledge in regard to sanitary regulations, and the enforcement of its laws. The principles of hygiene, which embraces several branches, are becoming better understood, while the laws governing health and disease are more fully recognized by the people. It has been truly said that the great principle of sanitation upon which it is necessary to insist is, circulation versus stagnation.

The important practical question which confronts us to-day is, how are we to broaden and present a more feasible medical education? The progress of development is

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so well marked, that the great object in view is to strengthen our schools by extending their course of instruction and a thorough grading of its students. This can only be accomplished by granting scholarship privileges to the Medical Department as well as to the Classical, Scientific and Agricultural.

Are not the living questions of health to-day as much to be fostered and protected as the dead languages of centuries ago? Are not the scientific teachings of medicine as much to be supplied and defended as other branches of science? Are not the germ cells of humanity as much to be nourished and understood as the tilling and harvesting of cereals? Are not the ravages of disease as much to be repulsed and disarmed as the approach of hostile armies upon our peaceful shores? Are not the beneficial influences of our institutions seen in the every day walks of life? Are not epidemics with their distressing mortality cut short and in every city and town are seen the fruits of our labors, by a strict enforcement of our sanitary regulations? Grant to us the same beneficent privileges that students of other departments are receiving, which will only be gained by our demanding recognition and our persistent enforcement of right and justice.

May the men of our profession in Vermont see to it that their labors of the past and the attainment of the present shall become the solid foundation upon which to build a broader and more thorough medical education.

DISCUSSION.

Dr. A. P. Grinnell: Mr. President and Gentlemen, I am very glad you had the Doctor open up this subject. It

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is a subject which has been very near to me as a practitioner, and more perhaps as a medical teacher in fitting the student for general work. That portion of his paper is especially worthy of discussion. It is true that at the present day the work that is necessary to equip the student for a physician is very great and requires a great outlay of money and a great number of teachers. We need very much more money than we have ever required before—very much more laboratory ; and there seems to be lack of desire on the part of public benefactors to endow medical colleges. There does not seem to be any such deficiency on the part of the Universities ; and the State seems to feel the necessity of paying a good many thousand dollars for the advancement of agriculture, and assisting its young men to become skilled agriculturists, but the number of states that have thus come to the relief of medical colleges can be counted on the fingers of one hand. I have always thought it was only just for the State to take an interest in the education of our medical men. It is necessary that we have all the advantages,—we are trying to do as much as our laboratory means wlll allow, and now, of course we shall have better advantages in that respect. We have to occupy a great many buildings aside from those we have a right to occupy.

Many of you who were here years ago and know how badly we were equipped, will see how much better off we are now than then.

The new Science Hall, the gift of Dr. Williams, will give us abundant room in certain directions. We are in this particular to be congratulated.

This, I will repeat, is a matter that I am doubly interested in and I have long hoped we should be able to interest

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our legislature, and if you will take an interest in this, gentlemen, we shall soon be recognized as a power.

Dr. S. C. Gordon: Mr. President and Gentlemen. I am not a member of the medical faculty of Bowdoin College, I am happy to say.

I do not believe in country medical schools, such as Maine, and I might almost say such as Burlington has. I think the only excuse that exists for any medical college outside of Harvard is in the exception of Burlington. I am a radical on this matter. I agree with Dr. Grinnell, that to-day a medical education means something. It means something more than when I graduated. If I thought a medical student to-day was turned out into the world by the University of Vermont, or any other college, who did not know any more than I did when I graduated, I should be ashamed of the student and ashamed of the University; consequently, I am decidedly opposed to the hundreds and hundreds of medical schools in the United States. They have no business to exist; it is a bare existence and nothing else. They are simply machines for personal aggrandizement for men,—pretty poor aggrandizement—nothing I should be proud of. I should not be proud to be connected with any medical college outside of Harvard or the University of Vermont. A few young men go out well prepared. I think you are doing good work here. We have a school of medical instruction in Bowdoin and I believe it is doing good work also.

I would say here that in Maine the students are well instructed with plenty of clinical material and hospital advantages; but the Maine medical school should be at Portland, and would be there but for some conditions.

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Again, I am very glad to stand up here and say that in the matter of medical education now, I think it means a great deal. That the students should be taught before they enter the study of medicine that it is a thing of a great deal of importance,—that they should not only be well equipped, but they should take those schools which can properly instruct them in all things.

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Cholelithiasis.

By E. H. Martin, M. D., Middlebury, Vt.

A woman, forty years of age, previously in good health, famous in her social circle as a cook, and demonstrating in her plump, solid physique her love for the good things of the cuisine, was suddenly and without warning attacked, late one evening, by a most excruciating pain. So intense and prolonged was her suffering that the doctor, hastily summoned from several miles away, found her writhing and tossing upon the bed in what is, without doubt, one of the most extreme forms of agony to which the human frame can by any form of disease be subjected. The pain, markedly paroxysmal in character, was referred to the epigastrium, and the stomach, reflexly irritated by the disturbance of a closely-related viscus, showed its sympathy by first emptying itself of its contents and then by repeated and well-nigh fruitless attempts at vomiting, which resulted only in the ejection of its scanty mucous secretion. The feeble pulse, the anxious countenance, the pitiful moans of the unhappy sufferer, the clammy perspiration and the cold extremities served to complete the clinical picture of suffering even to the verge of collapse. Only by the free and oft-repeated hypodermic use of mor-

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phine were the severe symptoms alleviated, until, finally, after many days had elapsed, the pain and the nausea quite suddenly disappeared. The epigastric region remained sore, and close examination would have revealed the acme of tenderness in the angle formed by the right border of the right *rectus abdominis* and the costal cartilages. She was finally able to be about the house in a condition of comparative health for about two months, when, as suddenly as before, there was an exacerbation of all the symptoms exactly similar to the original attack; and again with the lapse of time the sufferer's condition became ameliorated as before. Finally, after a second remission of several months' duration, the original symptoms suddenly for the third time reappeared with appalling severity, and a few days later a new and extremely suggestive feature made itself apparent in a yellow discoloration of skin and conjunctivæ, clay-colored stools and bilious urine—the symptom-complex of jaundice—and now percussion demonstrated the liver markedly enlarged. Once more as days passed her condition became alleviated and a very little bile was occasionally visible in the dejecta, although the jaundice persisted and she was still confined to the bed. About four weeks after the occurrence of the jaundice and at a time when her condition had become comparatively comfortable save for the lingering, sub-acute pain and tenderness, she turned over in bed, became unconscious, breathed stertorously a few times and expired.

The necropsy revealed the following conditions: The body, although materially reduced from its former robust and plethoric state, was still well nourished and the abdominal parietes contained adipose tissue two inches in thickness. The liver was uniformly softened and enlarged

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and extremely adherent by its under surface to the adjacent structures. No traces of the gall bladder or ducts were visible as separate structures—they being obliterated and covered up by the mass of adhesions. Upon carefully separating the adherent organs the common duct was torn across and from its lumen oozed abundant brownish opaque bile, and as it ran out it brought with it several concretions of small size. The gall ducts were uniformly dilated, so that a finger could be readily passed into them. There were eleven stones, faceted and of the usual color. Of these, two or three of the largest were of the size of a Delaware grape, and one of these was found at the duodenal extremity of the common duct, not impacted, but forming a ball valve over the normally-sized and pervious opening into the gut. The other abdominal and thoracic organs were normal, except that the heart and blood-vessels were in a condition of extreme fatty degeneration. A finger could be readily thrust through the cardiac walls. The brain was not examined and the immediate cause of death was not found, but the condition of the blood-vessels and the manner of death unmistakably suggested cerebral hemorrhage.

It must not be supposed that the details of the case just considered have been rehearsed on account of any very remarkable or unusual features which it possessed. On the contrary, the sex, age, physique and habits of the patient, the successive attacks and sudden onset of pain, its paroxysmal character, even the time of day of its occurrence, the absence of fever, the location of the tenderness, the nausea and vomiting, and, finally, the jaundice and hepatic enlargement form a clinical picture the significance of which could hardly be misinterpreted and which should scarcely require

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an autopsy for confirmation. As regards the *post mortem* appearances Fenger, at the meeting of the American Medical Association last summer, said in his paper on "Gall Stones in the Common Duct": "In the majority of cases these are floating stones and they sometimes act as a ball valve. In eighty per cent of these cases we find, instead of a dilated bladder, a small atrophied one"—exactly the condition in the case under consideration. The very fact of the absence of unique characters has suggested its introduction, that it may stand as a type of a very common condition, which in its essential features must often occur in the experience of every practitioner. If any further excuse be needed, let it be found in the fact that this very case was variously diagnosticated as gastralgia, gastritis, lead colic, peritonitis and cancer, and the real nature of the disease not perceived till within three weeks of death.

Looking at the symptoms pointing so obviously to the condition causing them and keeping in view the findings of the *post mortem*, let us enquire, "What was the sequence of pathological events which led to so unfortunate a termination?" In the absence of positive knowledge of the etiology of gall stones it is only possible to hint at the methods of life and the sedentary habits which may have formed the first step in the process, but, given the concretions already formed in the gall bladder, one of them of small size became engaged in the cystic duct. Immediately the suffering began and the intermittent, peristaltic muscular action of the gall bladder gave to the pain its paroxysmal character. Slowly the calculus passed through the cystic duct until it escaped into the common duct. The latter being of larger size, the stone rapidly traversed its lumen and dropped into the duodenum without having time to cause the symptoms

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of jaundice—a condition which requires several days for its appearace. Of course the impaction and retention of a concretion in the cystic duct produces no obstruction to the outflow of bile from the liver and hence no icterus. Such was the nature of the first attack, and the second was similar to it. The third and last attack was caused by the larger stone found at the autopsy, which entered a cystic duct quite possibly left more patulous by the passage of the first calculi. Reaching at length the common duct, and here giving rise to obstructive jaundice, it passed slowly along until it became arrested at the constriction marking the opening into the duodenum, and now the duct having been fully dilated and no longer tightly grasping the concretion, the pain ceased, but the stone, held against the duodenal opening by the pressure of the retained bile, formed a valve, which, however, was not quite perfect and allowed the occasional passage of the small amounts of bile seen in the dejecta. In the meantime, the other stones having followed in the wake of the leader, the emptied gall bladder became atrophied, and the local peritonitis set up by the great and long-continued irritation glued all the contiguous structures into a mass of adhesions. Finally an acute fatty degeneration of the heart and blood vessels, which is a not infrequent sequel to such cases, paved the way to the last and fatal event.

And now let us pause to consider what should have been the treatment of this case—what might have been done to bring it to a happier issue. The symptoms of gall stones before one of them has started on its travels are indefinite or *nil*. The unlucky patient, suffering no inconvenience, had no suspicion of her impending fate and consulted no physician, and even a physician would have been without a clue. No method of examination short of actual incision could

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have detected the disease, except in the rare cases where the thinness of the abdominal walls permits palpation of a gall bladder distended with stones. The clinical history of cholelithiasis is therefore identical with that of hepatic colic. Treatment, then, has a two-fold object; First, to get rid of stones already formed, and second, to prevent the formation of more. Many experiments have been tried with a view to discovering some drug capable of dissolving gall stones; and with success so far as the laboratory is concerned, but not so as to the body. Ether, chloroform, turpentine, olive oil and many others have been tried and found wanting. It requires a deal of credulity to imagine that any remedy taken *per os* will pass through the stomach, enter the duodenum and then travel the whole length of the common and cystic ducts in a direction contrary to the current of bile until at length it reaches the gall bladder in a sufficient degree of concentration to dissolve the stones there present. It may be safely said that there is no medicinal treatment for gall stones already formed other than those measures directed to the relief of pain and spasm. To prevent the *formation* of stones in a patient who has suffered from bilious colic may be quite possible, though appearances are often quite deceptive and conclusions too often prove mistaken. Long intervals may exist between attacks in cases untreated, and spontaneous cures may result, all the stones having been expelled. Again, in cases under really efficient treatment calculi already formed may continue to give rise to attacks of colic and seem to argue the futility of the measures in use. Finally gall bladders distended with concretions are often found *post mortem* in subjects who have never suffered from their presence. In short, the whole subject is beset with difficulties

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and uncertainties. However, it seems rational to suppose that the salts of sodium, which, as shown in the laboratory, possess the power of preventing the preciptation of cholesterine, may be given in sufficient doses, long continued, to prevent the formation of gall stones and finally cure the disease, and the consensus of opinion favors their use. The phosphate, bicarbonate or sulphate may be given, singly or in combination, in accordance with individual fancy, and many saline spring waters are used with apparently great success. During an attack of colic—while the stone is on its passage through the ducts—the leading indication is by opiates to relieve the pain, favor relaxation and promote expulsion of the calculus. But for those cases in which there is frequent repetition of attacks, or in which there is impaction, surgery offers the best and surest chance of success. The operation suitable will be different according to the circumstances. Removal of the gall bladder, incision of the gall bladder with extraction of the stones and immediate suture, and cholecystenterostomy by means of Murphy's button have all been practiced in many cases with success. Where the concretion is impacted in a duct, the latter may be incised, the stone removed and the opening closed by suture. Or a combination of operations may be necessary. In the case which forms the basis of this article none of these operations could have been practiced on account of the adhesions and other inflammatory changes which had taken place. But even here there might have been a brilliant chance for surgery. It would not have been a very difficult or dangerous matter to incise the duodenum, to dilate the orifice of the common duct, liberate the imprisoned concretions and then close the duodenal incision in the usual manner. Could this have been done

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sufficiently early—before the extensive degenerative changes took place in other structures—the unhappy subject of this sketch might be living and well to-day.

DISCUSSION.

Dr. L. W. Hubbard: Mr. President and Gentlemen:—I do not know that I can add anything to the very fine discussion of this disease by Dr. Martin. His discussion of the case that he had, covers a case that I had myself and was so unfortunate as to lose after four days' sickness—that being the third attack.

I will mention only a few points that occur to me--one is that age has a great deal to do with this disease,—while some more advanced in life would not recover, a younger person would. It is found in people of sedentary habits, fleshy and perhaps addicted to the pleasures of the table. It is sometimes caused by inflammation of the mucous membrane lining the gall ducts, flakes of mucus then have formed and are thrown off and inclosed by deposits from the bile, forming these gall stones. This is a form of gall stones formed from the bile. The chemical part of the bile should be neutral or alkaline, for if the bile becomes inspissated and thick, which conditions are favorable to the crystallizing of the bile salts, then we have a condition more favorable to the formation of these bodies.

Now, if that is the case the proper treatment is to keep the bile alkaline, then if that can be accomplished, the next point is to pay attention to the condition of the patient. The patient should be restricted in diet and advised to take those articles of diet which will be less

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likely to bring on indigestion, confining our patient to those foods that are devoid of fats, sugars, starches and carbohydrates. Give lean meats, recommend plenty of free out-door exercise, in order that this exercise may bring on better change of tissue and carry away the particles of fat. If this is taken pretty freely and there is some obstruction to the flow of bile, we find that it is more easily overcome, so that in this case we bring about the condition more favorable to this change of the regulation of the bile and less favorable to the deposit of the gall stones. I think in advising our patients to take out door exercise, we get them into oxygen and the patient is more cheerful and so improves rapidly, but once given an attack, I know no remedy so useful as opiates and possibly large enemas that will stimulate the action of the bowels.

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Intestinal Indigestion; Its Dietetic and Rational Treatment.

By William Henry Porter, M. D., Professor of General Medicine and Pathology in the New York Post-graduate Medical School and Hospital, etc.

This subject has been chosen because there is very little attention paid to the discussion and treatment of intestinal indigestion in our modern works upon medicine, and also for the reason that the malnutrition consequent upon intestinal indigestion is largely responsible for almost every disease that occurs in the human organism. In many textbooks this subject is entirely ignored, and at best it is only given a passing notice. In one of the recent and standard works upon the theory and practice of medicine, eleven lines only are devoted to this important problem.

To perfectly understand intestinal indigestion necessitates a clear conception of the chemical composition of food-stuffs and the transmutation processes that they must undergo before they can be absorbed and assimilated. This accomplished, the abnormal is quickly and accurately detected.

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Briefly stated, all food-stuffs when minutely studied chemically, are found to be composed of three distinct classes of compounds.

First, the inorganic substances, or those which enter the system under their own form, pass through unchanged, and come out in the same shape that they entered. They assist the economy physically rather than by chemical activity.

Second, the carbohydrate and hydrocarbon compounds, such as the starches, sugars, and fats. All of this group act primarily through chemical action, being oxidized into carbon dioxide and water with the production of heat.

Third, the proteids, of which there are two grand classes; the vegetable proteids, or those existing in a polymeric state, and the animal proteids, which are in the form of single molecules. Out of this class alone can all the proteid structures of the body be formed, either by a process of isomeric transmutation or by physical anabolism.

It matters little how complex the meal, the starches and sugars of all kinds have to be transmuted in part by the ferment ptyalin, but chiefly by the amylopsin, in the intestinal canal into a definite molecular form called glucose.

This accomplished, certain epithelial cells lining the small intestines have for their special function the absorption of this particular molecular form, which we call glucose, into their protoplasmic structure. In the substance of the cell, the molecule is isomerically transformed, so that when it is discharged, as it is eventually, into the entero hepatic circulation, it no longer responds to the common tests for glucose. From the entero-hepatic blood this

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carbohydrate compound passes into the substance of the hepatic cells, together with active oxygen brought to the liver by the oxyhemoglobin. Within the hepatic cells the oxygen attacks this compound and oxydizes it into carbon dioxide and water—as illustrated in the diagram—with the production of heat equivalent to 1657 kilogram-meters of work for each gramme of the carbohydrate thus consumed.

Thus this oxidation process with its heat production becomes one of the prime factors in maintaining nerve action, and, by being applied to the peripheral nerve endings, is, through the centripetal nerves, brought into direct relation with the central nervous system. It is by this constant heat production in the glandular organs of the body that nerve action is set in motion and maintained in action. Through this reflected nerve impulse from the periphery to the cerebral nervous system, and from the centre back to all parts of the animal economy, a harmonious balance of activity is developed and sustained throughout the whole system. All nerve action, therefore, takes its origin in the oxidation processes which are constantly occurring in the epithelial cells which constitute the coating of the body. These surface cells when bunched together, as they are in the liver and the salivary, pancreatic, and renal glands, etc.,are found to be the chief oxidizing zones of the body.

The animal and vegetable fats, like the starches and sugars, are transmuted chiefly in the alimentary canal by the action of the ferment bodies found in the pancreatic, biliary, and intestinal secretions.

The animal fat is transmuted in part into a fine emulsion, and in part into its components, a fatty acid and glycerin, the former joining with a soda compound to

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form a soap. The emulsified fat is drawn into the protoplasm of those epithelial cells which have for their particular function the taking up of fat. From the substance of these cells the fat-globules are discharged into the underlying lymphatics in the villi that support the epithelial cells. From this terminal lymphatic, which is a slight bulbous expansion ensheathed with muscle fibers, the fat is driven on to the deeper lymphatics, on through the thoracic duct, and finally enters the blood-stream at the point of origin of the left brachio-cephalic vein. Having gained access to the blood-stream at this point, the fat passes on with the blood to the right heart, and through this organ to the lungs. From the pulmonary capillaries the fat appears to be taken up, together with active oxygen, into the epithelial cells that line the air-sacs, and by a process of oxidation, the fat is here converted into carbon dioxide and water, with the production of heat. Thus, for each gramme of fat consumed in this manner in the lungs, the heat equivalent of 3841 kilogram-meters is produced. This heat stimulates the peripheral nerve-endings in the lungs with the same concomitant phenomena as were described in connection with the heat production in the liver by the oxidation of carbohydrate compound.

The soap and glycerin produced by the action of the ferment steapsin are a part of the laxative mixture which the system must produce each day to keep the bowels in motion and prevent constipation. The vegetable fats being less perfectly emulsified and more easily decomposed, are more likely to be cathartic in action and poor heat producers.

The proteids, or true tissue builders, all enter the alimentary canal in the form of alkali-albumin, either

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in the polymeric state, as found in the vegetable kingdom, or the "monomeric" form common to animal fluids and solids. In the alimentary canal the polymeric form must first be transmuted into the simpler form. This accomplished, alkali-albumin is acted upon by the hydrochloric acid, and isomerically transmuted into acid-albumin, after which it is further acted upon by the ferment body pepsin and transmuted into a series of albumoses, and finally into a true peptone, which is the only form in which a proteid can be taken up by the epithelial cells of the alimentary canal. The larger percentage of the proteids in the food-stuffs, however, passes through the cavity of the stomach into the intestinal canal unpeptonized. Thus we find that the function of the stomach is chiefly a storage and macerating tank, the major portion of the proteids, as well as the starches, sugars, and fats being transmuted in the intestinal canal. The ferment body trypsin, secreted by the pancreatic gland, together with the protolytic ferments of the bile and intestinal secretions, complete the peptonization of the proteids. When they have all been converted into this particular form in which the proteid can be drawn into the protoplasmic substance of the epithelial cells, they are absorbed by these special cells. After the peptone has gained access to the protoplasm of these cells, of which there are three distinct sets as regards their functions, it is further isomerically transmuted. One set of cells discharges the contained proteid into the entero-hepatic blood-stream as serum-albumin, another as serum-globulin, and a third as fibrinogin.

If the transmuting function of these cells is over-taxed, the peptone may be discharged as such into the entero-hepatic blood. The peptone being a toxic form of proteid,

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when it reaches the hepatic gland, the epithelial cells of the liver take up the peptone and transmute it into a non-toxic form, in a manner similar to that of the cells of the intestinal canal when they are performing their function normally, thus preventing general toxemia from the peptones.

After the proteid body has reached the enterohepatic blood-stream in the normal manner and has been properly transformed, it passes on, in one of those three forms, from structure to structure, being changed from one form to another, thus giving a different physical character and function to the various organs and structures of the body without undergoing any decided chemical decomposition, a small portion being thus transmuted to form the ferment bodies secreted by the glandular organs of the alimentary canal.

When the proteid has served its purpose to the body, it is again taken up into the protoplasm of the epithelial cells covering the body, chiefly into the cells which constitute the excretory organs, such as the liver and kidneys. At the same time that the proteid enters the cell, oxygen is introduced from the oxyhemoglobin of the blood into the protoplasm. This results in an active chemical decomposition or oxidation of the proteid, with the formation of the katabolic products, which are common to the excreta. Each gaamme of proteid oxidized in the body yields the heat equivalent of 1812 kilogram-meters.

With this understanding of the composition and utilization of the food-stuffs, if the food-supply is properly adjusted so that the constructive material is available and sufficient for the daily demands of the system, and if, at the same time, the heat-producing substances are of the

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right kind and quality, they can all be utilized perfectly without exhausting the oxygenating capacity of the system. In fact nature has allowed quite a wide margin for deviation. Were it not for this, it would be impossible to secure anything like a fair standard of health.

When these laws are observed and the food-stuffs kept well within the prescribed limits, the digestive functions will be perfectly performed, assimilation thoroughly maintained, and normal physiological phenomena only will be observed. Under these conditions the system as a whole will possess the highest possible degree of resistance against all disease processes. Lower this standard and the system is easily attacked by infections. Thus we see how it is that intestinal indigestion is a prime factor in producing all forms of disease.

The chief causes of intestinal indigestion are of two kinds: First, the presence of micro-organisms, and the fermentative changes produced in the food-stuffs in the alimentary canal by their presence; second, the taking of considerably more food than can be digested and perfectly oxidized, and also the taking of food of faulty composition. To these may be added, not as direct causes, but as conditions which influence perceptibly the perfection of digestion and assimilation, the kind of work which the individual has to perform, the lack of outdoor exercise, the peculiar conditions of the nervous composition, the mental state, climatic influences, etc., all of which play their part in influencing the digestive phenomena.

The micro-organisms are apt to excite the more pronounced lesions of the alimentary canal, such as true inflammatory conditions. Still, it must be admitted that most of the abnormal fermentative processes that occur in the

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food-stuffs in the alimentary canal have their origin in some form of micro-organism. While micro-organisms are always present in the alimentary canal, the normal secretions and digestive processes appear to be sufficient to prevent any deleterious influence from their presence, or any disturbance in the normal digestive phenomena. The most important factor, then, in the production of intestinal indigestion is the intake of too much food, and especially that which is faulty in composition (as the substituting of cows' milk for human milk in infant-feeding), or the use of vegetable or starchy foods in young children before the full development of the digestive organs.

The milk-sugar, the fat and the proteids contained in the milk of the mother are in that condition in which the digestive apparatus of the infant can most easily transmute them into an absorbable state, while the chemical composition and the proportions of the sugar, fat, and proteids in cows' milk are differently arranged, consequently not available in its natural state for perfect results in infant-feeding. Consequently the use of cows' milk alone is prone to produce digestive disturbances and mal-nutrition. When properly diluted and modified by the addition of other substances, such as egg and barley-water, cows' milk can be made available for infant-feeding. The mother's milk, when of perfect composition, yields the highest degree of nutrition with the least tax upon the digestive powers of the child. All deviations from this fixed plan of nature tend to lower the nutritive vitality, and ultimately excite intestinal indigestion.

In the adult, over-indulgence in food may be sufficient to cause intestinal indigestion. But when this is coupled with faulty composition a decided disturbance in the di-

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gestive process must follow sooner or later, depending upon the inherent chemical activity of the organism.

From a careful study of the normal process of digestion, it becomes apparent that a well-regulated mixed diet is the most desirable at all times, except in early infancy, old age, and in some diseased conditions, when a purely milk diet is the most desirable. A well-regulated mixed diet is one that contains the mineral ingredients common to the animal organism, the starches or sugars, the fats, and the proteids all so proportioned that the requisite amount of heat will be produced by the carbo-hydrates along the line of the entero-hapatic system and by the fats in the lungs, and the full amount of constructive material supplied.

The animal and vegetable kingdoms both contain these three classes of substances. No one of them is perfectly adjusted, however, for the best results, although milk, so far as composition is concerned, comes very close to perfection. But milk, like every other single article of food, has its defects. Therefore to secure the most perfect results the animal and vegetable compounds in some form should be blended together in outlining a well-regulated mixed diet.

The vegetables, taken alone, contain an excess of the starches and sugars, and comparatively little fat. Their contained proteid, which often exceeds in percentage that found in the animal kingdom, is less available for assimilation than the latter, because owing to its highly polymeric structure it is less readily split up to meet the requirements of the organism and is much more difficult to convert into a peptone. In fact, the task is so great that from fifteen to sixty per cent. passes through the alimen-

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tary tract without being so transformed, while with the animal proteids the loss is only from two to ten per cent.

Therefore, when living upon an exclusive vegetable diet, a large bulk of unavailable material must be taken into the alimentary canal to secure the absorption of the requisite amount of proteid substance. With this there is also an excessive amount of starch and sugar, and a deficient quantity of fat. If the individual has been blessed with a strong digestive apparatus, and can lead a comparatively leisurely and out-of-door life, many years may pass without material damage to the economy upon a purely vegetable diet. If, on the other hand, adverse conditions are imposed, as they frequently are with such a diet, intestinal indigestion and various forms of mal-nutrition will speedily follow.

The liberal use of fruits is another very potent factor in exciting abnormal fermentation of the food-stuffs in the alimentary tract. It is the irritation that arises from this disturbed action in the transmutations of the food-stuffs that makes them laxative in their nature. Many of the fruits in the market are plucked before they have had an opportunity to fully ripen; in their raw state they are often laden with micro-organisms, and at best are in a state of partial decomposition when they are introduced into the alimentary canal. Therefore they should be avoided as laxative agents.

A meat diet alone is defective in that it does not contain any glucose compound; but when the term "animal diet" is used in its true meaning it includes milk, eggs, butter, cheese, and all the products that are obtainable from an animal source. Under these conditions, all the three classes of chemical compounds are fully represented

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in an animal diet, and can be secured easily in the required proportion.

On the other hand, when the term vegetable diet is used accurately it excludes the use of butter, lard, eggs and milk, and every animal product, even in the process of cooking. When this is done it is found to be absolutely impossible to construct an exclusively vegetable diet in which the three classes of chemical compounds are properly proportioned. A near approach to perfection in composition, even if such were possible, would still necessitate the introduction and transmission through the alimentary canal of a large amount of waste and irritating material, owing to the great indigestibility of the vegetable proteids. Consequently, sooner or later, the system must suffer. It is for these reasons that the excessive use of the vegetable compounds and fruits is so prone to excite intestinal indigestion. In a similar manner an animal diet may result in intestinal indigestion, not so much from faulty composition as by the too liberal use of the animal food-stuffs.

These, then, are the essential conditions or factors that tend to, and do actually, cause the innumerable cases of intestinal indigestion which are constantly presenting themselves for treatment.

The clinical feature presented in connection with intestinal indigestion is an exceedingly complex and varied one. The symptoms may be acute or chronic in their nature. It is the chronic class, however, that are the most important and the most varied in symptomatology.

In the purely acute intestinal indigestion there are no primary gastric symptoms. The food taken has passed through the stomach without exciting gastric irritation. When the

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food-stuffs reach the intestinal tract, some two or three hours after the last meal, or even at a still later period, an abnormal fermentation is developed. Instead of the normal transmutation products of digestion, which give rise to no perceptible symptoms, abnormal products are developed, some of which are of a gaseous nature and cause considerable distention of the intestine, thus expanding the intraperitoneal cavity, and in some instances giving rise to actual and severe pain. This is especially true when the transverse colon becomes distended and crowded upward behind the stomach and in front of the vertebral column. When this is the case, undue pressure is brought to bear upon the solar plexus, which may cause an intense pain located at the pit of the stomach, or the pain may be more or less diffused throughout the abdomen. In other instances the distention simply causes a sensation of intense discomfort. In either case the distress continues until the gases are absorbed or discharged from the alimentary canal by being passed through the rectum and anus, or by being regurgitated into the stomach, from which they are belched up and discharged *per os*. This localized pain and belching of gas often cause the false impression that the stomach is at fault. The distention of the abdominal cavity often crowds up the diaphragm, which, together with the reflex disturbance in the nervous system, causes embarrassed respiratory action and a rapid and irregular heart action.

At the same time that the gas is formed, or even without much gas formation, toxic products, or ptomaines, are produced in the alimentary canal. These, when absorbed into the circulation, together with the peripheral irritation of the nerves distributed to the alimentary canal, cause

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marked constitutional symptoms and reflex nerve phenomena. The individual may have severe head-, heart-, and back-ache, and a sensation throughout the whole system as if he were under the influence of some toxic agent. There may be rise in temperature and a scanty elimination of urine. All these symptoms will rapidly disappear after free action of the bowels obtained through a mercurial; and what simulated strongly the beginning of an acute infectious disease will prove to be simply a case of intestinal indigestion, the normal state rapidly taking the place of the previously abnormal condition.

In the chronic cases it is much more difficult to exclude the stomach. In fact, in many instances it is impossible, because the long-continued imperfect intestinal digestion has caused defective action on the part of the liver, pancreas and all the organs which are concerned in digestion. A state of general mal-nutrition has been established, and the stomach has become weak and irritable in consequence. In other instances a primary gastric disturbance will lead to intestinal indigestion.

A careful study into the history usually shows that the stomach is not primarily at fault. The meals cause no primary disturbance or discomfort. There is no pain or vomiting upon taking food, the individual affected often declaring that he can eat everything, and that nothing disagrees with him. Yet this same individual will complain of great discomfort in the abdomen, coming at varying times after taking a meal. The intestines become greatly distended with gas, and the victim often experiences intense attacks of pain, relief coming, after an hour or two of acute distress, by the regurgitation of the gas back into the stomach, from which it is finally belched up and discharged

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per os. Observing such cases closely, the tongue is found to be soft and flabby, often showing the deep imprints of the teeth along its margins. The dorsal aspect is more or less heavily coated with a dirty, brown fur. The conjunctivæ and mucous membranes in general are pale, and show a decidedly anemic state of the blood. Instead of the clear and ruddy complexion indicative of perfect nutrition, the skin has a dull, muddy appearance—one hard to express in words, but quickly appreciated by the well-trained eye. The sclera and conjunctivæ are more or less tinged yellow, showing that the function of the liver is imperfectly performed. Depending upon the character of the faulty action of the liver there will be defective bile secretion of two kinds. The bile may be decreased both as regards quantity and quality. When this is the case, obstinate constipation is the rule. When the quality of the bile is altered, rather than the quantity diminished, it is often unduly irritating to the intestinal mucous membrane. This, together with the irritating products resulting from the abnormal fermentation of the food-stuffs contained in the alimentary tract, will, as a rule, produce a diarrhea. The diarrheal discharges often contain more or less mucus, without any inflammatory action in the intestinal canal. These discharges are also very irritating, and often produce considerable pain and tenesmus in the lower bowel and anus. The urine is apt to be scanty, high colored and superacid. The elimination of urine is decreased, and the output of uric acid is abnormally large. The bile salts and pigments are usually found in such samples. Oxalic and lactic acids, albumin, and glucose may be found in some of the more aggravated cases. This superacid condition of the urine, together with the consequent mal-nutrition

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dependent upon the long-continued intestinal indigestion, causes an unhealthy condition of the mucous membrane lining the genito-urinary tract, with a hyperesthetic condition of the nerves which are distributed to this canal. The over-acid urine now acts as a constant irritant to this supersensitive membrane, thus causing considerable vesical irritation, painful and spasmodic action on the part of the bladder similar to what occurs in connection with a true cystitis. There is frequent and painful micturition. It is often for these symptoms that the physician is first consulted, and the poor victim is vigorously treated for the local condition, while the true cause of all the trouble passes unrecognized and untreated. This continued absorption of toxic compounds from the alimentary tract, together with the reflex nervous irritation, keeps the liver continually overtaxed. The central nervous system is poorly nourished and unduly irritated. As a necessary sequence, we have a large and varied train of nervous manifestations. There may be intense headache, continuous or intermittent in character, mild or severe neuralgic attacks confined to single nerve trunks, or multiple in distribution, simulating in some instances a rheumatic attack. There may be insomnia, or a strong tendency to suicidal mania. There may be the opposite, or a stupid, sleepy condition, almost reaching semi-coma. In other instances all the symptoms common to the most aggravated neurasthenia are directly traceable to prolonged intestinal indigestion, abnormal fermentation, and toxic infection.

All the non-parasitic skin affections are, in a large measure, only the symptoms of intestinal indigestion, and not independent diseases. Thus we find the phenomena of intestinal indigestion presented in one great complex of

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symptoms, which are often misleading, and, by their local intensity at one point or another, often lead to absolute errors in diagnosis, followed by unsatisfactory results from the best efforts in the line of treatment. Accuracy in diagnosis in these cases can be secured only by a full comprehension of the physiological laws which govern the processes of digestion and assimilation by a careful study of the patient's habits, and of the method of the development of the symptoms, so that effects are not mistaken for causes.

The prognosis in these cases is good if they are recognized early and carefully treated upon a physiological and rational dietetic and therapeutic basis. The prognosis is less favorable when they have been allowed to go on for years, until some of the secondary effects become in themselves almost diseased processes. Then it becomes, in some instances, almost impossible to effect a cure.

The chief line of treatment to be employed in combating intestinal indigestion consists in regulating the diet in accordance with the well-known physiological laws that govern animal life. The physician must be thoroughly conversant with the chemical composition and possibilities of the various food-stuffs. A careful study must be made of each case separately and every idiosyncrasy for or against all food products accurately noted. The urine must be carefully examined, not so much for albumin and glucose, as to determine the comparative output of urea and uric acid, and also to ascertain what other forms of incomplete katabolins may be present in the renal secretion. This accomplished, the diet must be regulated absolutely, both as regards quantity and composition. The particular kind of food must be prescribed with just as much precision as the medicaments that are used. At the

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same time the urine must be examined frequently and the exact modifications in the elimination of the katabolic products carefully noted. When this is done systematically, the exact changes in the system can be determined accurately from day to day.

In prescribing a special diet one principle should always be kept in mind, which is, that a well adjusted mixed diet, when it can be perfectly digested, is the height of perfection. It will secure the most complete transmutation of the food-stuffs, and in consequence absorption and assimilation will reach the highest standard, and perfect health will be established.

In almost every instance of intestinal indigestion the mixing of the various kinds of food-stuffs, as is commonly done, will not be tolerated by the enfeebled and already defective digestive apparatus. So long as this plan is pursued the case will not improve. In all cases of intestinal indigestion, from the mildest to the most intense type, it is absolutely necessary to limit the diet to a greater or less extent, both as regards quantity and the kind of food-stuffs taken. In many instances it may be necessary to limit the diet to a few articles of food, as milk, barley-gruel, or broths; very limited amounts, so much so that, at times, the patient may even loose flesh, while the defective digestive function is being slowly but surely re-established. The fancy of the patient must not be considered, but that form of diet must be chosen which will be most effectually digested and yield the largest amount of nutrition. It may be wise at times to take out in a large measure the fat or the sugar from milk. This can be accomplished by ordering an exclusive skimmed-milk or butter-milk diet, or, on the other hand, a diet of kumyss or matzoon, the former

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taking out the fat and the latter the sugar. When any one of these limited plans of dieting is resorted to, the heat production necessary to keep the nervous mechanism fully in action falls to too low an ebb. When this is the case, a little alcohol must be added, as it can be oxidized and produce heat without expending any digestive energy, thus making up in a measure for the defective heat production. In other instances the plain milk diet will accomplish the best results. This is especially so when the milk is taken warm, or with a little limewater, barley-water, or eggwater added. Other cases will do better by excluding milk in any form, and limiting the diet to broths, gruels, eggs, etc.

An important point, which must be kept always in mind when a patient is placed upon an exclusive animal diet of any kind, is the well-known chemical fact that all animal food-stuffs contain a very low percentage of the nucleo-albumin—not enough to produce the hemoglobin and lecithin as rapidly as they are decomposed in the animal economy. This being the case, even if the subject is not already anemic, there is a tendency to become so upon an exclusively animal diet. Consequently some hemoglobin-forming compound must be continuously administered to supply the deficiency. As the vegetable class of food-stuffs contain a large percentage of the nucleo-albumin, it should be our aim to introduce some form of vegetable compound in limited amount as speedily as the digestive system will tolerate its presence without exciting undue fermentation. By so doing we supply most effectually the natural and only compound so far known to physiological chemistry out of which the physiological economy can easily and rapidy increase the hemoglobin

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and overcome the anemia. Many of the succulent fruits and green vegetables contain the largest percentage of this nucleo-albumin. When they can be tolerated, they are valuable for this purpose ; but, as a rule, they tend to excite so much abnormal fermentation of the food stuffs in the alimentary canal that they must be excluded absolutely. The vegetable substances that furnish a full supply of nucleo-albumin without abnormal fermentation are barley, rice, wheat, and rye ; barley and rye being especially valuable on account of the high percentage of the nucleo-albumin.

The mixed diet which most effectually meets the foregoing demands, as soon as it can be tolerated, is one composed of milk eggs, meat and toast, or stale bread and butter. Under the heading of meat is included fish of all kinds, game and poultry. Beef and mutton are taken, however, as the standard from which all the other forms of meat are caculated. If one particular form of meat cannot be tolerated, another kind must be substituted. In like manner, if milk or eggs cannot be utilized, some other form of food- stuff must be substituted. The same rule holds true in the selection of the vegetable substances. When these details are all observed carefully, a well-regulated mixed diet can usually be secured—one that will furnish the requisite amount of all the chemical substances that are required to sustain the animal economy and still keep well within the limits of the oxygenerating capacity.

The medicinal treatment of intestinal indigestion consists in the use of a little dilute hydrochloric acid, either alone or in combination with some pepsin, preferably alone, to augment the transmuting or peptonization of the proteids in the stomach. This accomplished, the amount of

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work imposed upon the intestinal digestive function is reduced to the minimum. Transmutation of the food-stuffs in the intestine can be greatly augmented by the use of a few grains of inspissated ox-gall and pancreatic extract three times daily before eating. The undue fermentation is also checked in part by these substances. To this may be added animal charcoal, resorcin, salicylic acid, naphtalin, phenacetine, or any one of the numerous intestinal antiseptics, so called, that may suit the fancy of the prescriber. None of them will produce any profound and startling results, but they assist in a measure to subdue the abnormal fermentation.

When the liver is performing its function abnormally, and the tissues are stained with bile pigment, a mercurial of some form is in order, and is always followed by an improvement in the general and the local conditions.

When constipation is a prominent symptom it must be overcome by some laxative agent, which acts upon the normal plan of nature.

Caffeine and strychnine are valuable agents in intensifying nerve innervation. They also augment the intestinal circulation and cause a more rapid and equable distribution of the blood throughout the body.

New York; 1674 Broadway.

DISCUSSION.

Dr. J. Henry Jackson: "Mr. President and Gentlemen of the Vermont State Medical Society:—The pen picture which has been presented to us this afternoon of a large number of cases that have come before you and me

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for treatment is so complete that I can add nothing to the discussion of the case as thus presented. We have had a real treat this afternoon, not only in the paper which has been so ably presented by Dr. Porter, but also the papers which preceded it and led up to it, taking up the diseases of gastric indigestion, the disposition of the liberated concretions which are to be overcome in certain conditions of the alimentary tract and the conditions which led up to this and which we so often see in the sick room. It has been a treat to all of us.

You notice too, that treatment should begin 30 or 40 years before the doctor really has opportunity to begin treatment. He very well suggests that treatment should begin with the infant. Here, I believe, in many instances, begin the disturbances and the numerous disorders of the digestive tract which are the bane of us as Americans.

I was particularly struck, also, with the suggestion which has been made of the use of a certain amount of stimulant in the treatment of that condition, which I consider as valuable, especially in that large number of adult women where the intestinal indigestion and all the train of annoying symptoms are accompanying it, particularly anemia. Use of the lighter wines and distilled liquors is also in many cases useful.

I was also especially pleased with the idea of antiseptic treatment. Surgery has led up to a place where we may make use of it in the treatment of all forms of indigestion. Salol is efficient in many cases,—remember, I am not taking away one particle from the statements of Dr. Porter, but I am simply suggesting some things in addition to his. Salol given in five grain doses once in four hours is a valuable aid in some of those infections cases. An old rem-

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edy—if I may be allowed to say so—creosote, has been very satisfactory, especially in this tuberculous variety in which we find indigestion, and where the phthisical part of the organ is swollen and inflamed and a large amount of mucus is thrown off and is reabsorbed, producing sepsis. There is a sluggish condition of the mucous membrane of the stomach and entire alimentary canal, and in that condition I have found beech-wood creosote given in small doses—four or five drops in distilled water with the addition of orange peel after each meal, will aid digestion and check fermentation—not only in the intestinal condition, but also the condition which led up to it. I believe that papoid given in five or six grain doses will also aid in this condition which I have mentioned, where there is an excessive secretion of mucus.

Just one more remedy,—in a class of cases which are a very great annoyance to the physician—where sleeplessness accompanies the indigestion—where your patient not only suffers during the day the troubles of the damned, but where sleep does not come to refresh or rest at night. I have been greatly relieved for the last few months only in finding a remedy that will help in these cases,—the chlorals, given in five grain doses three or four times a day with perhaps a larger dose, seven or eight grains, at bed time. The insomnia is the first relief, and then the intestinal indigestion.

By following out this plan of treatment, with the aid of other remedies, I think the disease will yield.

These are suggestions only, but have been found valuable in my own experience.

I wish personally to join with you in thanking Dr. Porter for his very valuable and interesting paper."

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Dr. M. R. Crain : " Mr. President and Gentlemen :— I have been very much interested and instructed in listening to Dr. Porter's paper. It is very far-reaching. I think there are more people who come to see the physician with various nervous troubles that are due primarily to indigestion than anything else. Another important cause, in my opinion, is the excessive use of tobacco and particularly among men of sedentary habits.

I think very many cases called neuresthenia are intestinal indigestion. Nervous prostration is certainly not a disease. It is only loss of vitality caused by impoverished nutrition, or it is not much less than indigestion, for if a person's digestion is good he can endure a great amount of nervous strain, and certainly that is an important factor.

A far as treatment is concerned, I think muscular exercise is of primary importance. At this day when people think they can afford but little time, you must prescribe some exercise by which they can use and call into employment a great many muscles within a short space of time. Probably the old practice of horse-back riding is one of the very best. I think also that bicycle riding is excellent in this respect, as I can testify from my own experience within the past week that it calls into play a great many muscles at the same time.

Dr. Branch : How about sawing wood ?

Dr. Crain : Well, the great trouble with that, I have never found anyone who particularly enjoyed it.

Dr. O. W. Sherwin : Mr. President and Gentlemen : We all know the opposition we meet with when we prescribe care in the use of foods. I have been opposed by patients who did not like to abstain from the use of fruits, as they felt that in all gastric troubles the use of fruits

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seemed to relieve the present symptoms. I think we should study well in each particular case whether we should advise against the use of fruits.

Another thing—I saw a case of Dr. Richmond's. He said he had a patient whom he would like to have me visit. He said he was not quite positive as to the nature of the trouble. There was some pain in the region of the gall bladder, and some enlargement as well. I examined it as well as I could, found a hard tumor there, but could not detect any stones, and I gave it as my opinion that it was cancer.

About a month afterward he had Dr. Stevens see the case and operate on it. He informed me that nearly a pound of gall stones were removed. I was unable to detect anything in the nature of gall stones, but such was the result.

Dr. L. M. Greene: Mr. President and Gentlemen: In regard to Cholelithiasis, in speaking, one gentleman here recommended the free use of hydrocarbons, but I must say that my experience is directly opposed to that. In my experience, it is the heavy meat eaters who are prone to gall stones, and as reason for that, I believe Dr. Porter spoke in his paper about the use of alkalies. That, of course, is only one of the ways of taking care of the cases. In my experience it is always in heavy meat eaters that we find gall stones, and the most satisfactory result is gained by prevention of the disease.

Dr. A. T. Woodward: Mr. President and Gentlemen: I rise to thank Dr. Porter for his paper,—not because it is entirely new to me, but because I have read Dr. Porter's books on the subjects of digestion and assimilation and have got more meat from them than from any other work

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that I have ever read or looked at. He has given me more points than I have ever got from any other source.

I did not rise to attempt to add anything to this discussion for you don't want candle light after you have had the full blaze of a noon-day sun on a subject; but I wished to thank Dr. Porter personally for his most excellent paper.

Dr. Porter: Mr. President and Gentlemen: I would say that I have been very successful in the expulsion of gall stones by hydrostatic pressure, brought about by stimulating the secretion of bile to the highest possible point, and in this way exerting a pressure sufficient to carry off the stone.

Among therapeutic agents, I have found in my practice that it keeps the case more comfortable if we will make it a rule to use salines between the severe attacks, and add some stimulant at the time of attack to get the necessary hydrostatic pressure upon the gall stones. In this way, I have succeeded in bringing away stones measuring 1½ inches in length and ¾ of an inch in width. I do not use opium. If you use opium, you will not get the hydrostatic pressure and the successful results of the other remedies. I have used to alleviate pain, exalgin, cocaine, phenacetine and salicylic acid. You can in a measure control the pain by this combination. It may be that these are all coincidents, but it seemed to me directly as a result of treatment.

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Cases of Tuberculosis Treated with Tuberculin and Antiphthisin.

By L. M. Greene, M. D., Bethel, Vt.

I am aware of the fact that tuberculin as a remedial or curative agent is very unpopular at the present time; but having treated two cases successfully with it I thought it might be of some interest to the society to get a report of these cases.

The first case is one that was treated by Dr. Charles Denison of Denver at first, and subsequently by myself. Dr. Denison treated the case with tuberculin to begin with for diagnostic purposes only. She had athritis of the knee joints contracted while nursing a sister three years previously, who died of tubercular disease of the pelvis and spine. During the three years after she had contracted the disease she had been treated by various surgical measures in hospital, etc., with no good results, always being obliged to get about in a wheel chair. General reaction followed the injection of the third, sixth, seventh and ninth milligramme doses, also slight local reaction in the left lung where she had, ten or twelve years before, suffered some slight diseases. A diagnosis of tubercular disease of the knee joints was thus established.

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No further treatment by tuberculin was made at this time.

Seven months after this diagnosis was made, an attack of grip seemed to concentrate the tubercular disease in the glands of the left side of the neck. Bacilli were found in the discharge from the same. The previous diagnosis being confirmed, a continuance of the tuberculin treatment was made from October, 1892, to May, 1893.

The result was excellent, the patient being able to go about without crutches some of the time, but always having to use a cane. The ulceration of the glands of the neck was entirely healed at the end of the treatment, and the general health of the woman good. This is the report of the case as given by Dr. Denison.

In the autumn of 1893 a return of the tubercular disease occurred in the right side of the neck in the region of the submaxillary gland and the angle of the jaw. On February 17, 1894, the diseased mass was removed at the hospital in Burlington. On March 5 following, I first saw the girl, the wound from the operation not having healed, and a new growth of tubercular tissue taking place, with a sinus leading down to the periosteum of the inferior maxilla, and a thinnish purulent discharge from the same. At this time there was a mass as large as a hen's egg and very hard. She was unable to open her mouth more than to pass the end of the little finger between the teeth, on account of induration and deposit about the articulation of the jaw on the right side. There was much soreness with but little pain in the growth. Temperature 99 2-5, remaining uniformly the same each day until treatment by tuberculin was commenced. Appetite good. I treated this case by alteratives (iodide of potassium and arsenic), tonics like

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iron, strychinia, etc., internally, and locally by injections of iodiform emulsion and packing the sinus with iodiform gauze until May 15. At this time as the mass on the neck and jaw was increasing and the sinus showing no indication of healing, at the suggestion of Dr. Denison I began the tuberculin treatment, by injecting 1½ mgs. in the interscapular region. I commenced with this comparatively large dose for the reason that she had previously had the treatment and was somewhat immunized, so to speak, and therefore not so susceptible to its influence. An injection was made every other day, increasing at first, the dose 1½ mgs. and then by 1⅓, 2 and 3 mgs. until about June 28, when the treatment was discontinued. No reaction occurred until the 16 mgs. dose was reached. Temperature on the day following was 100 F. No elevation was recorded again until the dose of 30 mgs. was given, when a similar rise was observed. Another reaction occurred on the day following the dose of 50 mgs. The last dose of 55 mgs. was given on June 28, and produced no reaction. At this time the induration was fast disappearing, improvement having begun after the end of the first week of treatment. The sinus had completely closed, and but a slight superficial ulceration remained, and this healed during the following week. Motion of the maxillary joint returned and within four weeks after the treatment with tuberculin was finished, the mouth could be opened to its normal extent. It will be seen that reaction occurred only three times during the treatment, this was shown by a rise of 1½ to 2 degrees of temperature, and a feeling of prostration came on about eight hours after the dose was given. That this was a case of tuberculosis is evident from the fact that bacilli were found in the discharge from the growth on the

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other side of the neck the year before, though none were found immediately before or during my treatment of the case.

After each injection with the exception of the three which produced systemic reaction the patient felt better, as she expressed it, as though she had taken a mild stimulant.

No physical signs of reaction in the lungs were detected during the treatment. There was, however, a sensation of oppression in respiration lasting two or three hours several times after the dose was given, and always after the dose reached 30 mgs.

This patient is now (September 29) in perfect health one year and three months after treatment. She took cod liver oil, iodide of iron, and arsenic until last May. Has taken no medicine since. When this patient came to me in March she was obliged to use a cane and to walk very slowly and carefully on account of the stiffness, lameness and soreness of the knee joints. At the end of the third week of the tuberculin treatment she left her cane at home and has never had to resume its use. She can walk a mile or two at a time and as fast as any one now. How long the present immunity will continue no one can tell, but it seems plain that by no other treatment could the disease have been arrested, as no doubt the bone (inferior maxillary) would soon have been involved, the periosteum already being diseased.

Another case was that of an old lady of seventy-eight years, with tubercular disease of the wrist joints. First called to the case in February, 1895. There was swelling and decided limitation of motion of the right wrist joint, with much pain upon attempted movements of the same.

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Treated the case four weeks by ordinary means, when an incision was made over the dorsum of the joint, and a discharge of a small quantity of pus followed.

Diseased bone could be felt with a probe deep down in the carpus. Iodoform emulsion was injected daily and the sinuses washed out with peroxide of hydrogen. Iodide of iron and arsenic internally. This treatment, or something like it, was continued until May 1, when a Boston surgeon saw the case, concurred in the diagnosis and recommended an operation for the removal of the diseased bone, and establishing drainage through the joint. This was flatly refused by the patient and I decided to make use of tuberculin. The styloid process of the left ulnar was at this time beginning to show signs of the disease.

The treatment was commenced by giving 1-20 mg. into the arm, the same sized dose repeated the third day following, and then increased by 1-10 mg. on each third day. When the fourth dose of 3-20 mg. was given systemic reaction occurred, the temperature going to 101° in the afternoon of the day the injection was given, which was at 8 A. M. Normal temperature returned in about fourteen hours. The next dose was only 3-20, the next 4-20 and the next 5-20 mgs., which produced an elevation of temperature to 100°. The treatment was continued six weeks, the last dose given being only 3 mgs. Could increase the dose only very slowly as reaction followed every second increase and a fall to the dose previous to the one causing the last reaction was made each time. The only effect that had been produced upon the local disease, at the time of discontinuance of treatment, was to increase the purulent discharge and also the soreness and lameness of the

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joint. But within a week after stopping the injections improvement began, and was continuous until the sinus in the right wrist closed and the pain, soreness and swelling were gone. At the present time the joint is perfectly well, so far as any active disease is concerned, no pain, soreness, swelling or lameness being present. Of course there is marked loss of power and voluntary motion is limited in the wrist and hand.

The evidences of disease of the left wrist that had begun to appear when the treatment was commenced, have all disappeared and both hands are well.

This patient has had a lupoid disease of the skin of the face for thirty years, which has markedly improved since the tuberculin treatment was made.

At the present time (October 2), the old lady is quite weak and feeble, and although her life has been prolonged several months by the recovery of the disease of the bones of the hands, she will probably not live many weeks longer as she has an organic disease of the heart, and is and has been very feeble for the past ten years.

ANTIPHTHISIN.

Case L. R. A., male, forty years of age. Commenced treatment April 24, 1895. Condition of the lungs at the time something as follows: Left side, bronchial respiration between fourth rib and clavicle, with slight dullness on percussion and increased vocal fremitus. Right side, upper lobe broncho-vesicular respiration with some coarse rales. Bacilli in sputum in large numbers. Much cough and free expectoration. Never had any hemorrhage, no chills and no fever. Appetite and digestion fairly good,

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but emaciation progressive. Had pleuritis with effusion in left side sixteen years ago, from which he fully recovered. Has had bronchitis of larger tubes for five years. Gave 1-10 c. c. Kleb's antiphthisin April 24, increasing by 1-10 c. c. each day until 1 c. c. was given on May 3, then increasing by 2-10 each day until 2 c. c. were given. On May 24, a dose of 3 c. c. was given and repeated each day until June 5, when the treatment was discontinued and the patient went to the White Mountain region to work at his trade, that of inside decorator of dwellings.

At this time no appreciable difference in the number of bacilli could be seen, but cough and general health much improved, weight increased and color of skin improved. Physical examination of chest found condition of lungs much the same as when treatment was commenced.

On September 5, he returned for a continuance of treatment according to arrangement when he left in June. Condition of lungs as follows: Right, respiratory sound nearly normal, occasionally a few bronchial rales. No dullness and vocal fremitus normal. Left, sub-crepitant rales between fourth rib and clavicle, with slight dullness on percussion. Temperature normal at all times of the day. Appetite and digestion good, and general health and strength improved. Cough troublesome and expectoration free. Number of bacilli diminished, there being about fifteen to the field, while there were more than could be counted easily when the treatment commenced in April. He is now, October 4, taking 3 c. c. every day and appears to be improving in every way. Whether an arrest of the disease will be brought about in this case is a question. After the present course of 100 c. c. is taken he will go to Florida to spend the winter.

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Jessie M. B., female, aged 20 years. Sister died of acute pulmonary tuberculosis last January. Commenced to cough in October, 1894. About January, 1895, the time of the death of the sister, temperature began to rise in the P. M., and registered 103° at night. Upper lobe of right lung infiltrated with tuberculous deposit. Sputum swarming with bacilli. Emaciation rapidly progressive. Commenced antiphthisin treatment in March, and gave it in fast increasing doses, until May 1st. No perceptible effect was made upon the progress of the disease or its symptoms, only a general lowering of temperature after the maximum dose of 3 c. c. was given.

Death occurred on the 18th of May.

The treatment of this case by antiphthisin was not undertaken with any expectation of any benefit accruing from its use, but simply to satisfy the immediate friends of the patient, some of whom had been told of the remedy as being a specific. Indeed no good could be expected from any method of treatment whatever in an acute case of this kind.

In the fall of 1894, I tried the effect of tuberculin in a case of chronic tuberculosis, the disease having begun two years previously. In this case, which was a female 22 years of age, there was a small cavity in the upper right lobe, much cough and expectoration, with an evening temperature only 99° at any time during the six months preceding the trial of the remedy. Sputum swarming with bacilli, too many to the field to be counted. Although the tuberculin, which was that prepared in Prof. Koch's laboratory, was given very cautiously in 1-20 mg. doses, and as cautiously increased by only 1-20 mg. every fourth day, the local reaction in the diseased lung was so great after the

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dose reached only 1 mg. that the treatment was discontinued.

After stopping the treatment the condition of the lung and patient returned to the same as before it was commenced. In June of the present year I tried the effect of Kleb's Antiphthisin upon this case, the condition of the lung and general condition of the patient being much the same as when the tuberculin treatment was given the fall before. The use of this substance could not be persevered in because of the nausea which followed the injections. No perceptible effect was produced otherwise. Antiphthisin, unlike tuberculin, causes no systemic reaction. It is claimed to be tuberculin with the toxic element left out and only the germicidal properties retained. It was at first prepared from Koch's tuberculin, and called tuberculocidin, but at the present time Prof. Edwin Klebs is preparing it, at the Winyah Sanitarium, Asheville, N. C., from a tuberculin made by himself, by an improved method, as he says, and the resulting product he calls antiphthisin, which is much stronger than the so called tuberculocidin. Klebs, with Doctor Karl von Ruck, director of the sanitarium above referred to, is making extensive use of the article in cases of pulmonary tuberculosis, and report many cures and improvement in nearly all cases in which it is tried. Of course the excellent climate and the institutional care and supervision of the patients that prevail at the Winyah Sanitarium, have much to do with the good results of the specific treatment.

DISCUSSION.

Dr. C. W. Peck: Mr. President and Gentlemen: I had not anticipated saying anything on this subject, and it

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seems to me to be a paper which is largely experimental. I have never made any such experiments, therefore, of course, am not prepared to discuss the paper. I think it is very valuable, however, and I hope the doctor will follow up these cases until the matter is clearly demonstrated. I can understand, however, that the change of temperature, being also on high ground, as the White Mountains, might make a wonderful change in the individual.

With regard to tuberculosis generally, I might say in this connection that I have had some very marked experience in the treatment of tuberculosis in consequence of changing from a low to a high altitude. I call to mind a case in our town some twenty years ago of a man who was working in-doors and who was suffering severely from an inflammatory deposit in the right lung This occurred in the latter part of the winter. As soon as the weather here permitted he went to the Adirondacks and remained there until the following September. On his return, I examined the lung and found it much improved, but in a short time there were symptoms of a return of the inflammatory action. He went back to the Adirondacks, and then returned to his business in the spring, when he went to New York to buy goods and while there he suffered from a dreadful exposure which again brought on all the inflammatory symptoms which he had before experienced and in a greatly increased degree. He was in very bad condition and kept growing worse. He was confined to the house some three or four weeks, was very much emaciated, and I am sure any of you here would have said he could live but a short time. I advised him to go to the Adirondacks again, which he did, and the following winter he went to Southern California. To-day the man is in perfect health, weighing 175 or 180

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pounds and looks as well as any man in this room. I do not think it was medicine that did it, I think it was the change from a low to a high altitude.

I believe that tuberculosis is a germ disease, and the more you subject a man to an atmosphere loaded with germs the more serious will his condition become; and on the other hand, place him in a high altitude and he will soon begin to improve.

I believe that it is right in this line that we get many diseases. I believe that many of our diseases are germ diseases. Take atmospheric pressure when loaded with germs, the air passing through the lungs carries these germs of disease to all parts of the body, and of course those organs which are weakest are most seriously affected. It also affects your future condition, so when you are submitted to exposure of any sort you more readily take on germ diseases.

I think perhaps, by fermentation, as Dr. Porter says, that the resulting ptomaines when absorbed into the circulation produce a varied line of symptoms. I think right in this line is a very important field to study.

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Address in State Medicine.

By C. S. Caverly, M. D., Rutland, Chairman Vermont State Board of Health.

State Medicine may be considered from two points of view. It has a truly scientific aspect to the man of science; the causes and natural history of disease and the influences that may be utilized to combat these causes. To the practical sanitarian on the other hand, State Medicine presents a semi-political problem; how shall the results of sanitary research be utilized for the benefit of existing society. While science, patient and painstaking, has evolved an all-important branch of the healing art and established it upon a very substantial theoretical basis, practical art has sought with equal industry the application of our knowledge to our existing social and political conditions. The profound research of modern scientists has made it possible to set up high ideals for the extermination of disease. The practical realization of these ideals has involved us in a crusade of education among the masses and legislative bodies.

The much-used aphorism—"Public Health is Public Wealth"—express an axiom, which the combined exertions of our profession and an enlightened public have made the basis of an important branch of all Governments, have given us in a true sense State Medicine.

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For many years State Medicine, Sanitary Medicine, Preventive Medicine was on the defensive. It really had to fight to prove its right to be. The people and the profession were almost equally slow to recognize this offspring of modern research. These struggles for existence are happily passed, and Health Departments—State and Municipal—everywhere attest the thorough conversion of public sentiment, while the work that is being accomplished by these departments proves the substantial accuracy of scientific deductions as applied to the prevention of disease.

It is therefore unnecessary in speaking of this latest branch of our art to make any pleas in its defense, to substantiate our arguments with citations from history from Moses down. It is a fact, to speak in modern slang, that Preventive Medicine has come to stay. That our Federal Government is so slow to adopt the suggestions of our representative Medical Societies, for the establishment of a Bureau or Department of Health is of course to be regretted, but the result will surely be attained in time even though we wait impatiently.

While we speak confidently of its firm position in our profession and in our local governments, it is not to be denied that Preventive Medicine has not yet been popularly rated at its true value. The modest, nay niggardly, sums that are generally allowed for this important work do not speak well for the appreciation in which it is held by our legislative financiers. I cannot do better than commend to you—and it would be well if they might reach our lawmakers too—the words of our representative to the American Medical Association, in his recent address before that body, comparing the meagre sums doled out to our Health Boards, with the munificent appropriations to the

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citizen soldiery. If it were possible to express in figures the comparative value of the work accomplished by these two State beneficiaries to the tax-payers, the argument would be complete. The quiet, unostentatious labors of our health officials do not appeal to the average legislator. That Preventive Medicine will ere long be better appreciated and more generously endowed, is quite certain. This end will be attained by the same persistent effort that has given it a place in the State. The masses will in time insist that they have the full benefits of scientific research at any cost. A medical man in one of our Vermont towns who had some difficulty in controlling an outbreak of diphtheria, wrote me: "The people of this place need a few first-class funerals to make them see the importance of restrictive measures." The grim lessons of disease and death appeal to the dullest intellect. Exemption from disease begets a feeling of security. But when health and life are actually threatened, when trade and commerce suffer, the cost is measured by dollars and cents as well as by heart-aches, other arguments are usually unnecessary. When diphtheria or scarlatina invade a school district or a town, when small-pox threatens a State, when the plague seeks entrance by land and sea, the people are fast learning where to turn. Such arguments are slowly effecting what didactic instruction does not, and State Medicine must in time receive financial support more nearly commensurate with the work it accomplishes.

The science of State Medicine as we see it to-day is the growth of a very few years. The discoveries on which it is mainly based are as young as the younger members of our profession. Pasteur, Koch, Ehrlich, Sternberg, and numerous other names rise before us at the

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mention of modern Preventive Medicine. The discoveries that have successively marked the progress of medicine during the past decade are still fresh in our minds. They occur with ever increasing frequency until it would require volumes to detail the happenings of a single year. The most cursory survey of the field is therefore all that can be attempted in this paper.

Tuberculosis still retains its place as the arch enemy of human life and the most attractive field for the investigator. The exact relation which meat and milk bear to the causation of this disease is being gradually determined. The latest contribution to the study of this subject comes from the royal commission appointed by Parliament five years ago. After the time consumed in reaching its conclusions it is to be presumed that they are reliable and conservative. The report develops nothing new or startling, and its value consists in its corroboration of the findings of independent observers. These points are noteworthy. Dr. Sydney Martin, one of its members, found there was little danger from the use of the muscular tissue of the cow ; what danger there was consisted in the chance that the parts used should contain some glandular tissue, or that they should have been cut by a knife used in diseased parts. Their experiments as to the danger from the milk, cream and butter of tuberculous cows developed the fact that they contained no bacilli unless the cow had disease of the udder. The milk from cows with diseased udders was extremely virulent. Their conclusion that no tuberculous cow should be allowed in a herd used for dairy purposes rests upon the fact that the disease is apt to attack the udder very suddenly, not that those in which the udder is sound are necessarily dangerous. Diseased

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meat is rendered innocuous by cooking on its superficial parts, but not always in its center. Boiling was most apt to destroy the bacilli, roasting was less apt to. The practical determination of such questions as these is extremely important, and the report of this commission, as will be observed, is very conservative.

The tuberculin test for bovine disease seems to be very generally accredited. Thus far it has proven the most reliable guide to a diagnosis. Out of a herd of fifty cows to which I was permitted to see it applied by Dr. F. A. Rich of Burlington, twenty-four were found by the test to be diseased. The post mortem examinations verified the diagnosis in each case. One scrawny, sickly cow in the same herd, that was considered as surely tuberculous by the owners, but which did not respond to the test, was found post mortem, to be non-tuberculous, while many to which the test was applied successfully, were apparently in perfect health. The certainty of this test is destined to make it of the greatest value in locating diseased cattle.

Diphtheria has apparently been attacked during the past year with great success. The serum therapy of disease is essentially the product of the germ theory; Behring, Ehrlich, Roux, and Aronson have each had a share in its application to this dread disease. Antitoxin appears to have made for itself an enduring place in the therapeutics of diphtheria. Though reports of use have not been entirely harmonious, and there are not wanting those, especially in England, who are still unreconciled to its use and who even pronounce it a failure, still I am confident that the consensus of opinion in the profession is now in its favor. But it is not of its therapeutics that I

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have to do. It has also been employed as a prophylactic. This application of antitoxin has been so far mostly in public institutions. The reports of its use for this purpose are very uniformly in favor of its immunizing effect. The period of immunity afforded by the antitoxin is variously stated as from thirteen to seventeen days as a minimum. It is to be hoped that the cure and prevention of diphtheria by this application of the antitoxin marks a very important epoch in the history of the disease as well as of medicine. It must still be considered as on trial, and sad experience warns us not to be too hasty in our judgment, yet it cannot be denied that the use of this serum so far warrants great hope for its future. In this connection it may be mentioned that a still more recent application of serum therapy is the discovery of Dr. Thomas R. Fraser of Scotland, of an antidote to serpent venom. Antivenine as he terms his serum, is claimed to render animals immune to the most deadly serpent venom. Its application to man is yet to be made.

Typhoid fever is a disease that has a very practical interest for us. Two outbreaks of this disease during the past year, both in the State of Connecticut, furnish one of the most interesting chapters in the voluminous history of this disease. Both of these outbreaks have been most carefully and scientifically studied by the Connecticut State Board of Health, and the results are very instructive. The first of these outbreaks occurred at Wesleyan University at Middletown. It included twenty-three cases of undoubted typhoid disease. These cases were distributed among the students of the college, in the college dormitories, fraternity houses, and village residences. There were no cases among the citizens of the place.

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It was found that all those affected had partaken of the initiation banquets of three of the Greek letter fraternities. After excluding in succession the water, ice, milk, ice cream, meat and vegetables, it was found that the only common article of the various menus that could by any possibility be suspected, was the raw oysters. These had been obtained of the same dealer, who in turn had received them from Fair Haven, Conn. It was further found that the oysters were taken from the deep water of Long Island Sound, and brought to the mouth of a fresh water creek at Fair Haven, to "fatten." Close to these latter beds were the outlets of several private sewers. Three hundred feet away emptied a sewer from a house where there were two cases of fever. These cases were diagnosed just about the time that the oysters were taken out and sent to Middletown. The chain of evidence thus established, together with several confirmatory facts, made a very conclusive case. Confirmatory evident was abundant. Of the seven fraternities that held banquets at this time, only the members of the three mentioned and their guests suffered from typhoid. Others used oysters but they were either cooked or obtained from other sources. Two Yale students who were of the number attending the banquets, suffered simultaneously from the disease. Twenty-five per cent. of the students attending these banquets were affected. The use of oysters from the same source by students of Amherst College was followed by an outbreak of the disease.

The other outbreak to which I have referred as occurring in Connecticut, was at Stamford, and occurred during the months of April and May. This epidemic involved 386 cases with a mortality of only 5.7 per cent. This outbreak was traced to the milk of certain dealers and thence

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to the cans of a single dealer. This man it was found was accustomed to wash his cans in the water from a well, which was unmistakably contaminated with the washings from a privy vault only twenty-five feet distant. It was not known that this privy had received any typhoid excreta, but its situation near a railroad, and with open door, made it easily accessable to a walking case. While the chain of evidence in this epidemic was lacking in completeness at this point, the investigators decided that it was sufficiently conclusive to warrant them in assigning this as the cause. I have referred to these two epidemics somewhat in detail because they are of rare interest and because they have been seemingly so carefully studied. They are each full of significance.

Serum-therapy has been studied in its relation to typhoid fever. Peifer and Brumer, two German investigators, have experimented in this direction with the blood-serum of sheep, and found it possible to immunize guinea-pigs and mice against three times the fatal dose of the poison. These experiments in serum-therapy are full of promise. Every infectious disease is being studied in this direction, and preventive medicine as well as therapeutics is sure to reap the benefits.

The Stamford epidemic, to which allusion has been made, illustrates anew the important bearing which the milk supply has upon the health of a community. That the infectious diseases may be thus disseminated is not new. But the systematic regulation of this industry by municipal governments is not so common as would be expected. Two epidemics of scarlatina in this State two years ago were early traced to the milk supply, and thus early checked. Similar occurrences are being reported

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with increasing frequency, until the Stamford epidemic seemed to have made a record in criminal negligence in this direction.

The supervision of milk supplies includes much more than a supervision of its source to guard against infectious disease, it also regards its quality as a food. This feature of the milk problem is not of so much importance to us who live in a distinctly rural State, but to crowded urban populations it becomes a very vital question. Still I am convinced that a careful supervision of all common milk supplies, even though the distribution be on a small scale, is sometime to become an important feature of our Health Department duties. London and New York have taken hold of the problem very energetically and the extent of the evil of adulterated and disease-distributing milk—or as termed by the London Commission, sophisticated milk —is becoming better known. From some of the reports that are published with official approval it would seem that milk dealers as a class were a very conscienceless lot. But while this psychological element in their make-up seems to be so dwarfted, the skill displayed in evading law and cheating the public marks them as far from fools.

A review of the recent history of State Medicine would lack completeness if mention were not made of the increased exertions which are being made to protect infant life and lower infant mortality in the great cities. The enlightenment of the tenement house dwellers in nursery hygiene and the causes of infant diseases, by Board of Health tracts, the furnishing of pure and sterilized milk free or at a nominal cost to the poor, excursions to country and seaside for the sick poor, public baths, these and similar measures to combat the terrible infant mortality of our large cities are

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very God-sends, and are worthy a prominent place in the records of modern Preventive Medicine. It is but just to mention in this connection the work of New York City Board of Health, the pioneer in many practical sanitary movements.

The establishment of free baths, laws to regulate the epidemic prevalence of infant ophthalmia, the vigorous watchfulness of food and milk supplies, improvement in school hygiene, these and similar movements are among the most commendable features of recent State Medicine. While State Medicine as a science interests itself largely with diseases, there are problems in connection with their causes and development that should be mentioned in a review of its progress and present status. The disposal of sewerage, human excreta and town garbage, and the relation that the disposal of these waste products bears to a pure water supply, have become very embarrassing questions to the practical sanitarian. Sewerage systems and sewers without systems are everywhere even in isolated country hamlets considered necessary accessories of existence. The systematic disposal of town garbage has not received scientific attention outside the large cities. While sanitary engineers and experts discuss the advantages and disadvantages of sewage-farms, crematories and reduction processes for garbage, electrolysis and electrized sea-water for sewage, every town and village in the land solves each its own individual problem by emptying its waste into the nearest body of water. The great seaport cities utilize the ocean, the lake cities the lakes and every inland town the nearest river or creek. This goes on until the Mississippi, the Ohio, the Hudson, the Merrimac and our own Otter Creek and Winooski, yea even our small mountain streams

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are veritable open sewers and sources of pure domestic water supplies are exceedingly scarce. To such an extent has this fashion prevailed that we are involved in a seemingly hopeless attempt if we seek to prevent river-pollution. The protection of our great inter-state water-ways has been the subject of memorials to Congress. It has engaged the serious attention of State Boards of Health. But the practical accomplishment of the end has nowhere been attained, nor a feasible remedy been suggested. The only solution of this vexed question seems now to lie in the purification for domestic use of the polluted water, its protection being rarely attempted.

The attempt is being made to supply pure water to cities dependent on these sewage-contaminated streams, of which Hamburg and London furnish two notable examples. Here filtration of river water through artificial filter-beds has met with apparent success. This is especially true of the city of Hamburg, where the filtration of the water of the Elbe as suggested by Koch, has apparently relieved the city of all anxiety on account of a threatened recurrence of cholera. In this country experiments of the same kind have been tried, notably at Lawrence, Mass. To procure pure and abundant water-supplies, free from any suspicion of disease germs, is now a vital question with many flourishing communities. This State with its myriad brooks and springs is by no means free from perplexities of the sort mentioned. Pure water-supplies are not so plenty as formerly. More populous villages are every year polluting the neighboring streams with their sewerage, and some are unquestionably now using diluted sewage from such streams. The questions that are being asked and an-

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swered elsewhere have a very practical interest for us, and that interest must every year increase.

There was recently held in New York city an important meeting of representative bacteriologists from all parts of America, called by the committee on water-supply of the American Public Health Association. This gathering was called as stated in the invitations, "to establish some common ground-plan for systematic work in bacteriology in general and in the bacteriology of water supplies in particular." It is to be hoped that the results of this gathering will mark the beginning of a new era in exact knowledge of pathogenic bacteria, especially as related to water-supplies.

The recent death of M. Louis Pasteur, the most conspicuous figure in the world of medical science, calls for passing notice. Pasteur's scientific career began as a chemist; later he became a professor of physics and of geology; fermentation engaged his attention, and finally bacteriology. It is in the role of bacteriologist that his name became a household word, and on his discoveries in this field will his fame in our profession chiefly rest. His early work was full of discouragements and in the face of severe criticism. He rescued the chief industry of his country from ruin by teaching silk-growers how to eliminate diseased worms. He discovered the anthrax bacillus, and in late years his name has been universally associated with the protective inoculations against rabies. He is very properly termed the father of bacteriology. Unlike many pioneers in science, Pasteur lived to see his theories generally accepted; he lived to receive unstinted credit from former critics, and the homage of a grateful world.

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He belonged peculiarly to our profession. and to him it is probably under deeper obligation than to any other man. His untiring labors have done more than those of any other to popularize Preventive Medicine as well as to give it a place among the sciences. It is fitting then that we, in common with the whole world, pay reverent tribute to the memory of this modest Frenchman.

These are some of the prominent features of the recent history of State Medicine. Volumes might be written of the happenings in this department in one short year. Scientific research with ever increasing accuracy is fast formulating rules; the practical sanitarian with equal vigor seeks their application. Here we have the student with laboratory equipment and logical mind; there the sanitarian who must understand the latest results of laboratory work and keep in touch with existing social conditions. The study of disease and disease-producing conditions and the application of the results to modern life are, as I stated at the start, the component factors in State Medicine.

The safeguards that science suggests and the State applies to human life are daily becoming more complex as its enemies and their methods of approach are better known. The remarkable development of recent years augurs well for the future. Medicine and surgery are sciences of prevention as well as of cure. Popular enthusiasm grows apace. The doctor's field lies not only in controlling disease actually present, but also in educating his clientele in its cause and prevention. Doctor and laymen are fast becoming common allies against these insidious foes of the race. The coming year and years to come promise startling results. The full realization of our hopes, the extermination of preventable disease, is perhaps distant. Yet pessimism is not a domi-

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nant factor of the time. The highest type of civilization in these closing years of the nineteenth century is characterized par excellence by an ever increasing faith in scientific medicine, notably scientific Preventive Medicine.

The perfect control of preventable disease—the triumph of State Medicine—of which we already get hints, will be the crowning blessing of the highest civilization of the future.

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The Medical and Surgical Treatment of Appendicitis.

By S. C. Gordon, M. D., Portland, Me.

In announcing the title of my paper, I seem to hear the ringing of the chestnut bell, and, in an undertone, a chorus of "roasted chestnuts," so much has this subject been paraded in local, state, national and international societies and in medical journals throughout the world; and yet I venture to add another to the long list, for I find on much inquiry, that the profession is still divided on what is the best method of managing this disease, which has excited so much attention within the past five or six years.

The profession has been ridiculed, caricatured and made the butt of innumerable jokes on what the penny-a-liner has considered a "fad," while all have been considered "cranks" for believing that the disease has even existed at all. Nevertheless, I am sure that every honest man in the profession knows very well that there has been a much larger percentage of these cases within the time named than existed before in the same number of years; while the laity are asking, if this be true, why is it?

I believe it to be true that the cases have largely increased in the past few years, and my reply to all such

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questions is, that it has increased *pari passu* with the other disease so prevalent during that period, viz.—la grippe, and in my opinion, in consequence of it. In thirty years prior to five or six years ago, I feel sure the profession had not seen so many cases as since. This is my observation and I think the Fellows of this society will justify this, if they will recall their own experience. So far as I know, this theory is largely a personal one, but when we consider the myriad forms of disease that have followed this epidemic, we may logically infer that the intestines, that have suffered in so many ways, should show special infection at this point. So much by way of deviation from the subject matter of the paper—treatment.

Nearly all writers on the subject consider the treatment under a surgical head and teach that only by what they term "early" or "timely" operation can salvation to the patient come, and my friends from Massachusetts, and especially my friend Dr. Worcester of Waltham, goes so far as to say "that every death resulting from appendicitis where the patient was not given the benefit of immediate surgical relief, is due to malpractice," and "holds as responsible for the continued death roll, both those who advocate other methods of treatment and those who tacitly approve the propriety of delay in such cases." He also says that "nobody ever did die of appendicitis or ever will," meaning by that, if the appendix could be amputated at the very moment the attack began in the appendix, and before any of the surrounding peritoneum were involved, that operation would save the life of the patient. For the mere sake of argument, I am willing to admit that, if he can get any comfort from the admission. But how many of us general practitioners ever see a case in that

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stage of the disease? I am writing now for the men who see these cases many hours, and sometimes days, after the attack began, and in country districts and under circumstances where surgery is entirely out of the question, both on account of environment and lack of skill and experience in operation. What shall the average young man and average general practitioner do under these circumstances, is the subject matter of this paper. I believe as fully and as strongly as any one of these men that appendicitis is a surgical disease, but I do disagree as to the time that surgery should come in.

From a quite extensive experience covering a large number of cases, within the past eight or ten years, I am sure that "early and timely" *medical* treatment, has saved many more from immediate death, than has surgery as it has ordinarily been practiced.

I purpose, therefore, in this paper, simply to briefly sketch a number of cases that have come under my care and observation, illustrative of medical treatment during the acute stage, from which all recovered, many of whom were subsequently operated upon after convalescence and others apparently well without operation, and still others who have declined operation, but have had one or more similar acute attacks. Assuming that all these cases are peritonitis when they come under our care, it remains only to consider how we will treat them. I believe that the profession are agreed that in no case is this condition (peritonitis) absent. It is only a question of degree. In the catarrhal form, the inflammation may be confined to the appendix alone, externally, with adhesions from exudate poured out around it, gluing it to the cæcum and parts lying in contact, or perforation may take place, allow-

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ing septic material to escape, producing peritonitis involving only the small space external to the cæcum and perhaps extending up behind the head of the colon. The case, left to itself, may go on to the formation of pus, that may be absorbed gradually or open into the general cavity or colon or find its way out externally. Or still another degree, where almost from the first a general peritonitis follows perforation, and left to itself soon terminates in death, attended with extensive gangrene of the intestines, omenteum and parts involved. In fact, in all the cases where I have seen post-mortems, gangrene of some portion of the intestine has been present. This condition is in my opinion the chief point to guard against, and I believe that by prompt, free, active, medical treatment we may do much to prevent it. Pus of itself is not deadly, but often entirely harmless—at least for many weeks it will remain in the peritoneal cavity, and when relieved by natural or artificial means, the patient rapidly recovers. In many instances quite large quantities will be gradually removed by absorption, *i. e.*, the serous portions will become absorbed and the more solid portions undergo a caseous degeneration and become gradually removed. I have frequently operated between attacks of appendicitis and found this condition. I shall cite instances of all these varieties.

Given, then, a peritonitis, what shall be the treatment? In all other cases of peritonitis, *i. e.*, from all other causes, the professional world seem well agreed to follow the plan, so long advocated and practiced by Mr. Tait, of giving salines freely, with a view to relieve the overdistended blood vessels of the part affected, before complete stasis occurs and gangrene results. If this is done in the

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early stages and leeches are applied externally, the results, in my experience, have been invariably salutary.

Since 1886 I have followed this plan, in all cases of peritonitis without regard to cause, and have seen no reason to doubt its great value. I am sure it has proved far superior to the old, opium method. I have never known it to fail in a case of appendicitis that I have had charge of from the first, and it has also been successful in no less than a dozen cases, where the disease had existed from three to seven days, under the old treatment by opium. In several of these latter cases I am sure that pus had formed, and in many of them I proved its existence by finding flakes of caseated pus, at an operation made after convalescence was established. In all of these cases I followed the saline plan so long as any elevation of temperature remained. I frequently combined with this large doses of quinia, after the free catharsis induced by the salines. In no one case have I resorted to surgical means where I have had full control of the case myself, until full convalescence was well established, and not a fatal case has occurred. Since commencing this plan, my personal experience covers at least twenty-five or thirty cases, while I am cognizant of many more treated on the same plan by physicians in different sections of New England, some of which I saw in consultation, while the physicians treating the cases have written me in reference to many others. In two cases there was general suppurrative peritonitis, and the abdomen became filled with pus, the patient surviving this condition, in one case eight and the other fifteen weeks and finally recovered after operation. While the salines did not prevent or cause absorption of the pus, I am sure it saved the life in each case.

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The following are types of the various forms and varieties of appendicitis alluded to, all treated medically during the acute attacks :

Miss ——, age 15, in the northern part of New Hampshire, was taken with all the violent symptoms of appendicitis, vomiting, severe pain finally locating in the right iliac fossa. The pain was so severe that the attending physician gave opiates to the point of quieting it, temperature ranging from 101° to 103.8°. This continued for six days when I saw her in consultation and immediately advised salines, by mouth and enema. I feel very certain that pus had formed from the tumor and history.

A few hours were sufficient to obtain free catharsis, and fever abated, pain ceased and from that date a slow but sure convalescence followed. I advised operation as soon as she was well enough, but the friends were unwilling. A second attack came on before she was able to go out of doors, but a prompt repetition of the salines soon cleared up the symptoms. That was five years ago, and there has been no return to my knowledge.

Three years ago, I saw in consultation a young lady fourteen years of age. Like the former case, I was sent for to "operate for appendicitis." The patient had been very ill for a week, with high fever, well marked tumor and everything pointing to abcess, but deeply seated. The bowels had moved but once during the time. I at once began with the saline enema, followed by Seidlitz powders every hour. Within twelve hours we had a decided abatement of symptoms and she eventually regained health,—no operation has yet been permitted.

Two other cases in the eastern part of the State, where I was sent for to "operate," were out of danger when I

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arrived ; both, in my opinion, due to the treatment by physicians who believed and practiced the cathartic plan. The first case ended spontaneously by sudden flattening of the tumor, followed by a copious discharge of pus from the bowels. Dr. Varney, then of Union, Me., (now in Massachusetts) saw each of these cases and particularly in the last followed the saline method. Whether the pus, in the first case, came through the cæcum by perforation, or was in the appendix at the junction, I am unable to say, but the facts are as stated. My impression, derived from the history of the case, is, that it was abcess around the appendix, rupturing into the cæcum. I am aware that occasionally we find a perforation through the cæcum in the neighborhood of the appendix in connection with a gangrenous appendicitis. I do not think it necessarily due to the presence of pus at that point, but to softening of the part as a result of the inflammatory process.

The two cases following show how tolerant the abdominal cavity becomes when gradually invaded by pus : Case first was that of a female child about 8 years old. The symptoms at first resembled typhoid fever, but with pain in the right iliac fossa, fever was nearly continuous, and within a few days a general peritonitis ensued, which the attending physician supposed due to a tubercular condition. I saw the case at the end of eight weeks from the commencement of the attack and found the abdomen filled with pus ; abdominal section showed a gangrenous appendix with perforation, as the cause. I washed out with bi-chloride solution and the patient recovered entirely from the effects of the operation, but subsequently died from tubercular disease. I believe, had I packed and kept up drainage with gauze, that even this would have been prevented.

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The second case was, in many respects, very like the first, particularly in its early history, although the special symptoms of appendicitis were so well marked, that the attending physician used salines freely, but the fever relapsed frequently and the abdomen became prominent, and very pointed at the umbilicus, finally opening there, discharging pus and fecal matter. This continued for five or six weeks, when I saw the case in consultation fifteen weeks from onset of attack, made abdominal section and found the appendix entirely gone, with an opening into the cæcum as large as my little finger. There was a fistulous track from it to the umbilical opening. The pelvis and abdomen were filled with pus, which I washed and sponged out, and packed with gauze only. The case did well and is now well.

I believe with the physician in attendance that each of these cases were perforations of the appendix from the first, which at once developed a general peritonitis. I also believe the free use of salines relieved the intestines of many of the toxic elements, as well as unloading the inflamed blood vessels, thereby preventing gangrene.

Treated by opium, or by surgery in the "early stages," I believe they would have died. I do not mean to be understood that I would have waited so long before operation, as in these cases, but would have operated in the first *distinct remission*. I cite the cases to show that it is not absolutely necessary, in order to save life, that even cases of this character must be operated upon early, but that life can be saved by postponing operation, provided the medical treatment is such as to prevent gangrene.

In the fifty or sixty cases where I have operated, "in the interval of attacks," since June, '92, I have treated many of them through one or more (one for two) acute attacks.

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In five I felt sure there was pus, but circumscribed, and yet preferred to wait. In all five of these cases I found the most conclusive evidence of pus having existed, viz: pus itself, either fresh or in a caseous state. In six of the cases there was either perforation of the appendix, or total destruction of the latter in two cases. In one of the cases a perforation existed directly through the whole diameter of the appendix, with the edges completely cicatrized, which I have no doubt took place four months previous to last attack; there were three other openings but rough and granular. In one case the appendix was filled with with pus; in another it was filled with a colloid mass, distending it to the size of the middle finger of a large man. In three of the cases the opening into the cæcum was direct, the appendix being entirely gone in two and nearly so in the third, and the bowel being closed by suture.

In no one of these operations did I have any cause for anxiety (as indicated by symptoms) except in the nineteenth, after the first day. The nineteenth died from hemorrhage. In no case did I drain except in the two cases where pus had filled the abdominal cavity. The others all healed primarily. In each case I was able to remove the diseased appendix, where any was left. In "early" operations this cannot always be done. Within the last two years I have had under care two very severe cases, which have terminated safely by the saline plan. One a man of thirty, the other a boy of sixteen. The latter had a decided remission at the end of a week, for two days, when the temperature returned to 103.5°; a free use of salines promptly cleared up the symptoms and he is now entirely recovered. I have no doubt that pus formed in each of these cases. Of course many of them never have a second attack, but as there is

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always danger, I recommended the operation in the interval. A letter from Dr. S. B. Overlock of Steuben, is of interest in connection with the use of salines. I make the following extract: "Was called to Capt. D. P., Sept. 4, 1893. Master mariner, aged 60. All the well marked symptoms of appendicitis. I tried to impress upon his mind the gravity of his situation, but he refused to believe there was anything serious about his case, saying he had "ten or twelve similar attacks," during the last ten years, had always taken a "big dose of salts gone to bed and stayed there without moving round until soreness and lameness had all disappeared." In present instance he had been sick seven days and as he had no "salts" he took a dose of "Parson's Pills." The doctor very properly operated in this case and saved his patient. There was a well marked circumscribed abscess and the inflammatory process had practically ended. The appendix was sloughed off completely. The doctor further adds that the intelligence and probity of the Captain render it probable that his account of his previous attacks is reliable.

It is pretty generally accepted that a *very large* percentage of cases recover under ordinary medical treatment, sometimes very ordinary, as in the Captain's case. Fenger, in a very elaborate article, published in the *American Journal of Obstetrics*, for August, '93, claims that "the mortality in general of appendictis is only about 5%." He then quotes Pepper saying that 20 to 1 are cured permanently without operation." Ranvers collected from the reports of the Prussian army, 2,000 cases with 96 per cent. of cures without operation, and from his four years service in the Charité in Berlin, 54 cases with 3 deaths. Vollert gives the statistics for 7¾ years in Nothnagels Clinic in Vienna,

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65 cases, 3 deaths. Fenger adds, "The facts mentioned above seem to me to put an end to any absolute claim of surgery upon appendictis." I would amend this by saying "during the acute stage." In this connection I would ask the following question:

Is it good surgery to advise an abdominal section in every case of disease, which terminates favorably in 95 per cent. or even 90 per cent. under ordinary medical treatment?

Again, admitting, as we all do and must, that a certain number of cases are of the so-called "fulminating" character and will of necessity die, under medical or surgical treatment, we find that a portion of this 5 or 10 per cent. of deaths are inevitable.

With my experience and knowledge derived from reports of cases made by men who practice the saline plan, I believe that 90 per cent. of the remaining deaths can be prevented by a prompt and early use of salines, to the extent of relieving the congested vessels, removing exudate and preventing gangrene and suppuration.

Furthermore, from my own experience and others' reports, I feel quite certain that operation "in the interval of attacks" will not have a mortality of more than one or two per cent. I think no advocate of "early operations" will claim as low a percentage of death as this. It must be admitted that the opium plan adds a large list to the fatal cases, by masking the symptoms and postponing the time, when the "early operator" would say was the "golden opportunity." Reports are full of cases where the "operator" was "called too late." Had these patients all been treated for *peritonitis, without regard to the cause,* by salines, instead of by opium, the "toxic" elements would have been elimi-

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nated and the inflammatory products removed before suppuration and gangrene took place. If the case had not terminated by resolution, the integrity of the tissues would have been maintained. From my experience and observation I believe that every case would be in better condition for operation, at any period, if the salines have been used early, while 95 per cent. will go safely through a first attack. If this be so, are we not justified in claiming that appendicitis, in the early stages, is a medical rather than a surgical disease? Will not more lives be saved by this plan, than by that which advises operation *in every case*, especially when we consider the delays and oftentimes impossibilities of obtaining surgical aid? Is it not better to teach this principle to young men rather than to leave them floundering in the mazes of doubt as regards the "best time" for "operating?" A condition is present which calls for relief. The septic element has done its work and even if a little more is added it cannot aggravate the trouble. A match may ignite a flame, which left to itself will destroy everything in its reach—another match cannot increase the flame materially. The wise engineer will rather seek to extinguish the flame he has than to capture the incendiary or prevent another match being applied to the same building. When the fire is extinguished remove the cause of any future calamities of like character.

Applying the simile to the case under consideration I would say, treat the condition that exists and when danger is past and a large part of the debris is removed by absorption, apply surgery and excise the diseased appendix to prevent future attacks. I know of many cases where operations have been made during the acute attacks, where it was impossible to find the appendix, except by breaking up the

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abscess wall and opening areas of peritoneum, and setting up fresh peritonitis, therefore it is not taken away. There is very little difficulty in this direction "in the interval." Believing in these general principles, I would most cheerfully subscribe to the view that appendicitis is a surgical disease, after recovery from one well marked attack, but not in the early stages.

I have frequently had a condition like the following: After treating the case with salines for twenty-four hours or more the temperature subsides, the pain is relieved and everything is favorable, but in a few hours fever comes back and acute symptoms arise. In such a state of things I operate immediately and have invariably saved my patient. The integrity of the tissues had been saved by the salines and the parts soon recovered.

If I see a case in the early stages I never give opium, no matter how severe the pain, but soon relieve it by Seidlitz Powders or Epsom Salts in hot water, (saturated solution) or the stomach failing to retain it, give the saline enema—Epsom Salts and glycerine.

Richardson, than whom there is no better operator, reported a mortality of 44 in 181 cases treated by operation, others report many fatal cases. It is to be said of such a distinguished surgeon that he was undoubtedly called too late in many of them.

All of us have a similar experience, and in some of my own cases where I have operated as a last resort, I have almost invariably regretted doing so.

I have never seen any of the ill effects from salines, so much feared by Dr. Richardson and others, but always more or less relief.

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I have found foreign bodies in the appendix but once, some small fruit seeds, frequently fecal concretions, but many times nothing but inflammatory products.

My conclusions are:

1st. That appendicitis is always to a greater or less degree peritonitis.

2d. That it is much more frequent than formerly and due in my opinion to germs caused by the epidemic of Influenza that has so generally ravaged the world.

3d. That salines have been successful in peritonitis from other causes, far beyond any other form of treatment, and in my own practice and that of many others in appendicitis, never doing harm.

4th. That a majority of cases must be in the hands of men who are not experts in surgery and must be treated medically, and modern experience and common sense dictate the cathartic rather than the opium plan.

5th. That the opium method masks symptoms, checks elimination of toxic elements and causes stasis in the blood vessels, by paralyzing the vaso-motor nerves, thus favoring gangrene.

6th. That the saline plan promptly relieves pain, washes out the toxic elements and *most important of all*, UNLOADS *the distended vessels*, thus preventing gangrene and maintaining the integrity of the limiting membrane, formed by exudate, even in suppurating cases, and saves life until surgical aid is required or can be obtained, (in cases demanding immediate operation.)

7th. That in cases of well-marked limited abscess, or general suppurative peritonitis, early operative procedure should be instituted, but in all cases such operation should be preceded by the saline treatment.

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8th. That by following the above general principles 95 per cent. will go safely through the first attack and often several subsequent ones.

9th. That a large percentage of cases undoubtedly fully recover after one or more attacks, and no recurrence ever takes place.

10th. That inasmuch as there are no indications whereby we can determine the cases that will fully recover, after one attack, it is safer to advise operation before a second one, especially as the organ is diseased to a greater or less degree.

11th. That the danger in delay is much greater after one has reached the age of 40, although the liability to seizure is much less, owing to atrophy of the organ and closure of the opening into the cæcum.

12th. That while surgery may save some lives in the very earliest stage of the disease, it is not practicable at that time, but should be adopted after sure recovery from the first attack.

Dr. D. A. Robinson, of Bangor, spoke as follows:

Mr. President and Gentlemen:—In discussing this paper, as Dr. Gordon has said, we are very much in danger of having the chestnut bell rung upon us; but it is one of the cases that shows more distinctly than almost anything else the difference between the old and the new methods of treatment, both medical and surgical. In the evolution of the species we find ourselves still behind some of the animals, as I believe that cats do not have an appendix; that may perhaps account for their tenacity of life, somewhat; and I remember, when in the medical school, that

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Dr. Wilder, now of Cornell, in view of the approaching and apparently increasing tendency to appendicitis, said that he thought as Moses had instituted circumcision as a matter of hygiene and made it a religious rite, that we ought now to make a new rite of that kind and remove the appendix of every baby, sometime within the first three weeks of its life. As all modern treatment tends towards prevention, this would be in the line of modern advancement and, I think, would be a very good thing if everybody would do it; and when we make our record of births we could record the time at which the operation had been performed, just as we do now with vaccination and other things of that kind considered necessary in modern life. If operation between attacks is so safe, operation before any attack must be yet safer. When Dr. Palmer was a teacher at the Maine Medical School, in describing the treatment of appendicitis he said that he had had an attack of it himself and that he treated himself with calomel, opium and quinine, and entirely recovered. He recommended opium and calomel as the most advanced and the best method of treatment of appendicitis at that time. The change from the calomel and opium to the present treatment is about the same kind of a change that has come on through all the various departments of medicine. But it seems to me that each case presents some aspects that are different from every other case. I have, as I came over in the cars, thought over cases that have occurred in my own practice, and almost every one of them (I could think of twelve or thirteen at the time) presents some new features that are not common to them all; and I don't see how every single case can be treated by a cast iron rule. Of course, if we could see every case at

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just such a time, say at the first onset, then there might be some regular rule of treatment, but coming as they do to us at all kinds of times and under such varying conditions it seems to me that judgment must be used in each particular case, and the treatment varied to suit the circumstances. I remember in the first years of my practice, a case where I found a lump in the right iliac region, I called it according to the teachings of the time, peri-typhlitis, I gave opium and used poultices upon the outside and I guess I gave him quinine too. He recovered and went to Boston; a little while after he had the same kind of an attack and under the same treatment he recovered again, and never has had any other attacks. So they sometimes get well under the old opium treatment, and the opium and calomel treatment.

One of the next cases I had was a man who had fallen from a load of hay and complained of a severe pain in the right side; very soon a peritonitis developed, beginning on the right side, which I suppose was appendicitis; I treated him with opium and poultices according to my teachings at the time, and I remember of calling in old Dr. Seavey as a consultant; the man was too far along to operate on even if they had dared to do such a thing then, and almost too far to treat, but Dr. Seavey recommended ten grains of calomel, in addition to the opium. He said: "He has got to die anyway, and you can give that, and if he dies they will probably lay it to the medicine, but it is the only chance I can see." I didn't want to take that chance and so I didn't give it to him; the man died the next morning. Dr. Seavey was considered one of the most successful practitioners of the time. It was the treat-

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ment then to give opium and calomel among a majority of the practitioners with whom I came in contact.

One of the next cases that I had was a young man about sixteen years old. I had seen him two or three times in as many years with attacks of pain in the bowels. I didn't consider it appendicitis at first, and a hypodermic injection of morphine always relieved him. He finally had an attack which was more severe and accompanied with some fever; I gave a hypodermic which relieved him. In a day or two I gave him another; finally his fever and pain abated, his bowels moved naturally; still he was sick, and couldn't get out of bed; I couldn't find out what was the matter, why he was going on in that sort of way. His mother got anxious and asked me to telegraph Dr. Weeks; I did so and he came on in the evening; he said the young man's bowels were full of pus; I asked him why he hadn't fever; he said he supposed the morphine had masked the fever. We opened the bowels and they were full of very bad smelling pus; we packed with gauze and he rapidly recovered. This was a good lesson for me, and I haven't been caught so since. This young man had this last attack come on after playing ball; he had been struck by a baseball in the side. I mention this fact because I believe that a large number of these cases of appendicitis can be traced to some such accident as that, or some severe muscular exercise.

In the next case a young man had been eating very heartily; he was a ravenous eater; he was taken with pain in his right side; his bowels filled up, and I at once, instead of giving him opium, began to give him salines to move his bowels; as I was unable to start them that way I went to work with saline injections and persevered until

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the bowels were thoroughly moved. He very rapidly recovered from this attack, after thorough catharsis; four or five days later he had another attack; I gave him salines again. In a short time he was apparently well, so that I stopped treating him; and his father, seeing he was apparently perfectly well, had gone away on a visit; I think he went Saturday, and Sunday afternoon I was called again, and Sunday night the boy died. He was, so far as anybody could see, entirely well; his temperature, bowels, pulse and everything seemed perfectly normal; and yet he suddenly died,—from a perforation of some kind, I presume. He had been treated with salines without operation.

Last summer I had a very striking example of what Dr. Gordon has explained to you. A man whom I had been called to see in the night, perhaps once or twice in two years, for what he called a bilious attack, had a great deal of pain in his bowels and vomiting. A hypodermic injection of morphine always, in previous attacks, had set him to work the next day. At this time he said: "I have another of these bilious attacks." I gave an injection of morphine, went home and went to bed myself, as Dr. Gordon says we usually do in such cases; but the next afternoon he called me again and said: "This don't seem to relieve me." He was vomiting, so I thought I would try an enema of starch and laudanum and see what would happen. The next day he was worse. He said: "I feel as though I ought to have a movement of the bowels." Then I went to work and examined him as I ought to have done in the first place, and I found swelling, pain and tenderness in the right iliac region, and other symptoms of appendicitis; then I began to give

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salines, his bowels soon began to move and he felt very much relieved. Saturday I went down to where my family were, down river, leaving him in the care of another physician. He became so much worse the next day, Sunday, that this gentleman called in consultation two other doctors and they said: "You must operate immediately or he will die." "Well," he said, "I don't want to operate on the doctor's patient while he is gone," and so he mixed up for him ten or a dozen Seidlitz powders in one glass and had the patient take a teaspoonful every fifteen minutes and kept that going so that almost all the time the bowels were moving. When I got back Monday morning he told me the man was going to die, and I thought so, too. He was in no condition to operate on so I kept up the salines; by the end of the week the man was better, and he is now entirely well, never has had another recurrence. The three other doctors who saw him thought he couldn't possibly live without operation; I thought he would die if operated on and so took chances. A year ago I was called to see a young lady in a neighboring seminary. She roomed on the fourth floor and the dining-room was in the basement, so she had a great many stairs to climb every day. She was at school but a few weeks when she was taken with severe pain in the right iliac region, fever and the well marked symptoms of localized peritonitis. The local physician treated her for a few days, and finding her growing worse telegraphed for me. I decided on immediate operation. We found a large amount of foul smelling pus, but walled off from the general peritoneal cavity. I packed the cavity with gauze and she rapidly recovered. This did not seem to be a case for salines nor for any delay.

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The points I would make then are: that the salines are a great improvement over the old opium and calomel and quinine treatment, and with these alone the majority of cases of appendicitis will recover; but there are occasional cases that require operation at once; that each case must be judged by itself from its own conditions and not from any theory; and I would add as a personal observation as to etiology, that I think many cases are the result of excessive muscular exertion, blows, falls, strains, etc., as well as from the causes more commonly assigned in the books.

DISCUSSION.

Dr. L. M. Bingham: Mr. President and Gentlemen:—I personally wish to thank the doctor for his very excellent paper. It has given me some new ideas upon the subject; and I must confess that I was surprised at the theory of the more frequent occurrence of the disease, and I do not know why it should not be true. But if we accept this, that its frequent occurrence is caused by la grippe, we must also admit that it supplants the cases which formerly came under the head of peritonitis. Where we formerly heard of twenty cases of peritonitis, now we hear of probably one. All cases of this nature that we were unable to classify we formerly called peritonitis, but now we classify them as appendicitis.

Another point in regard to the accumulation of pus in the peritoneal cavity, I have had some experience with these cases and have found what appeared to me to be an abdominal cavity full of pus, but in which I found after investigation the seat of the disease to be primarily in the appendix, and that adhesion had taken place.

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I have, within a year, had two or three cases where the peritoneal cavity seemed to be distended with pus. When opened it discharged freely a stinking pus and when a larger opening was made, large masses came out. Now those cases on free incision and drainage have improved rapidly. Have always found that the necrotic tissue could be cleaned out, and in all of them the peritoneum intervenes between this and the intestines. I have never seen a case where the abdominal cavity was filled with pus.

And now as regards surgical cases of appendicitis, I believe that surgery has gone too far, that is, that the young surgeons, those who are working hard and trying to operate upon these cases are liable to go too far in their work; but, I believe that these cases of appendicitis can be just as successfully operated upon as pus in any other part of the body, if we diagnose the case and are satisfied that pus is there, then it is our duty to open it,—we should not leave it there any more than we should leave pus in any other part of the body.

It is not necessary to find the appendix and excise it if it is held down by adhesion, but it is good surgery, in my opinion, to open it and give free drainage. It is not necessary to try to remove the appendix, unless it is free in this cavity. The case is complicated just the moment you make a small incision searching for the appendix and break up the adhesions; you do damage to the tissues and then you have general inflammation. I believe the great mortality is due to this. I have talked with surgeons—those who have done extensive work in this direction—upon this subject, and they say it is without doubt the cause of so great mortality in these cases. But it is proper

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that these cases be operated upon when you are satisfied that the pus is there, and I believe it can be done by the general practitioner. There is usually a point where the pus can be reached through the abdominal wall without interfering with the intestines. If the abdominal wall is opened and you do not come upon the pus, I should not give it up. Then you have reached so far through that you are better prepared to find this suppurative point, and when you are satisfied that you have it, I do not believe in fingering or breaking up tissue with the handle of the scalpel, but by palpation examine until you are satisfied where the pus is and then it can be let out by proper drainage.

In regard to the doctor's plan of operating during the period of intermission, we all understand how difficult it is. When the case is recovered, they always want to wait to see if they have a second attack. I am sure this is a subject which interests us all, especially general practitioners.

I believe saline the best treatment. I believe, as the doctor has said, that opium should not be used, as it tends to mask the symptoms and put our patients in jeopardy. Free cathartics are the most satisfactory, and after you have tried them two or three times you will go on and treat cases in this way, and by it, there is no doubt but many can be relieved in the first stages.

If, on examination, we find hard the spot to be slightly elongated, and on pressure of your finger it shows no evidences of pus, I do not open the cavity or try at all to find the appendix; but when the temperature rises in twelve hours three or four degrees and the tumor is increasing in size and fearful that perforation will take place, I believe it is good surgery to step in and operate.

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This is a new idea to me with reference to the character of pus which we find in an operation, being that broken down and that remains in the periteneal cavity so long, and not doing any harm.

I will give one case in illustration. The case was a very severe one. Found the large tumor or mass on opening, to be filled with pus. The appendix was necrotic and opening into the cæcum was a hole large enough to pass the finger from outside into the cæcum. It was necessary to dress this with drainage in order to keep it in condition. It is a very difficult matter to stitch up these openings into the intestines and have recovery. In this case I headed in the intestines to the outer wall of the abdomen so that this opening in the intestines was closed in by the abdominal wall. It has now been about a year since the operation and no bad symptoms have resulted from it, so I expect it is cured.

There are many physicians here who are able to give some interesting talk on this subject, because it is something in which we are all interested and have all had more or less experience.

I will say again that I was exceedingly interested in Dr. Gordon's excellent paper and he has given us all some points to think about. I believe you will find the salines very helpful and very successful in this disease.

Question from the house as to how long Dr. Gordon would continue the use of salines?

Dr. Gordon: I am generally satisfied after I get three or four good movements, of course following it up the next day and watching the case carefully.

Dr. A. T. Woodward: Mr. President and Gentlemen:—I do not know that I have any right to speak here,

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but before I did leave the world I had some experience with perityphlitis, and I have treated a great many cases of peritonitis. I treated them with opiates.

The doctor mentioned the use of leeches, but I think you can accomplish the same work by vesicating the surface with blisters. I have seen but one case where a return of the disease had to be contended with, and in that case it returned three times and in each instance was overcome by the use of blisters.

Teale's treatment with the salines has come into vogue since I went out of business, and I am convinced by reading his works that you can do no better than follow his treatment. I believe it is a good remedy. Salines must be used in the very onset. There is nothing that will be so sure to relieve the case as leeches or blisters.

I have seen several cases where pus came to the surface through the abdominal wall, and in others through the vault of the vagina. I now think possibly those cases where the pus came to the surface through the vault of the vagina were cases of what we now call appendicitis, and which we formerly called perityphlitis. The doctor says it is localized in most cases. We are to understand that the peritonitis is limited; would not that case come under the head of perityphlitis?

Now, it seems to me, in looking at the paper, that you state that you operate after recovery. I do not see why you should see the necessity of an operation after your patient has recovered. Am I to understand that you meant after the acute symptoms had subsided and there was still danger of the existence of appendicitis or a return of the trouble? That part I could not understand.

I thank you very kindly for your paper.

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Dr. W. H. Vincent: Mr. President and Gentlemen:—I do not see how you can treat these cases without opiates, as one of the most prominent symptoms is pain. Now, my experience is that salines will increase rather than diminish pain, and I think unless Dr. Gordon is luckier than the most of us he will have two or three days there before he gets any relief for the patient. I went to know what he will do with a patient writhing in agony on the bed. How would he quiet the patient if not by opiates?

Dr. W. G. E. Flanders: Mr. President and Gentlemen:—Until about three years ago I treated the majority of my patients with opiates. About three years ago, I commenced the use of salines. The point Dr. Vincent has just raised brought to mind my manner of treatment at that time. I gave the combined treatment of morphine, hypodermically, and the salines. The latter were given in a half-hearted manner; but even then the results were much more satisfactory than under the opium plan.

Something over a year ago, I was talking with our friend, Dr. Gordon, upon this subject, at which time he gave me his plan of treatment and reasons for same, substantiated by the results obtained, and it is a pleasure for me to be able to say that from that day to this I have not been guilty of administering opium in a single case of appendicitis, and more than that, I have not found it necessary to operate in any acute or primary attack where I have seen the case from the beginning. In only one instance did we fail to get the desired action by the use of salines taken by the mouth; but by the use of solution referred to by the doctor, by the rectum, we did get the desired result. I have operated on only two cases during

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the past year, one after five and the other after seven days illness. In both cases pus was present and the appendix was perforated. In each of these cases, salines were used previous to operation.

There is just one more point in the saline treatment, and to my mind, equally important in after treatment of operative cases, and that is the use of salines as soon as any pain is present, or if the temperature reaches 100, or even in the absence of both, they should be commenced within twenty-four hours; by so doing you can avoid tympanitis. This I consider of great value and always follow it in laparotomies and with the most gratifying results.

I wish to thank the doctor for his excellent paper and also for his kindness in calling my attention to his form of treatment, as I can but feel that it has saved the lives of many of my patients, as well as robbed me of the opportunity of operating.

Finally, gentlemen, I think that with the statistics of 95 per cent. of cases relieved by salines, our course is plain. I enjoy operating myself, but I think we take too many liberties in this direction.

Dr. S. C. Gordon: Mr. President and Gentlemen:— In reply to Dr. Bingham in regard to the pus, I think I should open and drain. For instance, if I find a case that I have had under my charge, and treated with salines for a few days, and then am satified that pus remains there, there is still a little fulness and a slight rise of temperature, by salines I have relieved the blood vessels at the part around the pus and nature has made a good wall around this localized

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peritonitis, I see no harm then in operating. I do not call that operating in the acute stage of the disease.

In reply to Dr. Woodward, why operate after the patient has recovered, the disease has its origin in the appendix, whether the appendix was ruptured or not. Even if we get no pus, we get adhesion of the appendix which will cause more or less pain and soreness, and I operate for that, but in the majority of these cases, there has been perforation of the appendix and the contents of septic nature has escaped from the appendix. After the acute attack is over, after the patient has recovered, there is still left a disease which may give rise to another attack and frequently does, therefore, I remove it.

The term perityphlitis has now practically gone out of use, all those cases in which the appendix is involved being now classified as appendicitis.

I have never used the ice-bag, though I see no objection to it, but I prefer leeches; but more than all the rest I believe in salines, as by their use we deplete the mucous endo and reduce inflammation.

In regard to pain, and here to me is the most important thing, for I am called in consultation in so many cases where the physician will say this boy or this girl has suffered beyond all powers of description, and we must quiet this pain. I admit that sometimes it is hard, if the disease has gone on until muscular paralysis has taken place, but it is surprising how quick you can get an operation, and I find it the easiest thing in the world to control. You must have courage and quiet your patient by your own self-control, telling him that when he gets relief in this way it is permanent.

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It does not take days nor many hours to get the full effects. Put the Seidlitz powder into hot water, as has been suggested, wait until the foaming is all over and you will be surprised to see how soon you will get relief. If the patient vomits one, give another powder in half an hour, give half a Seidlitz powder every half hour until you get relief. If the stomach does not retain them give them through the rectum in 4 oz. of water. Give it very, very slowly; put the patient on the left side with the hip lifted. I would use the bulb syringe so there shall be no air in the tube. Carefully withdraw the tube, very, very slowly, tell the patient to hold on as long as possible, the rectum very soon becomes distended, and you will have a good movement from the bowels. The patient is then relieved at once and relieved permanently. Here is the time when we must have courage and say to the patient "You must wait." Often, I get a movement within an hour from one Seidlitz powder, but here is the great thing. They have pain which is terrible and perhaps insist on my operating at once and here is the difficulty. I said in my paper Dr. Worcester would operate at once, as soon as diagnosis is made, but when we do so, that operating is always accompanied with danger of increasing the inflammation developed in the peritoneum in the region of the appendix. The moment you do that, you spoil the whole thing. Give salines by the mouth and by the rectum, and you will be sure of your reward.

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The Border-Lands of Insanity.

By S. E. Lawton, M. D., Brattleboro, Vt., Superintendent of State Insane Asylum.

An early recognition of the premonitory symptoms of insanity is a subject of growing interest, and one that hardly receives the attention its importance demands.

If we are familiar with the early warnings of mental disease, many a useful member of the community may be spared and perhaps years of suffering averted. It is a well-known fact that the chances of recovery from mental disease are lessened in proportion to the length of time it is allowed to run without being brought under the influence of appropriate treatment.

Winslow says: "Incipient insanity, provided it be not the result of severe physical injury to the head or has not a congenital origin or is not associated with a strong hereditary predisposition, yields as readily to treatment as incipient inflammation or any other disease with which we have daily to contend."

"I think," says Dr. Woodward, "it is not too much to assume that insanity in its incipient form, uncomplicated, is more curable than any other disease of equal severity; more likely to be cured than intermittent fever, pneumonia or rheumatism."

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Experience proves that nine cases out of ten recover if placed under treatment within three months after the attack. It is, therefore, specially the duty of the general practitioner who is first called to such cases to familiarize himself with the early symptoms of this distressing malady, in order that he may arrest its progress at a time when curative measures are most effective.

In response to our inquiry, when patients are brought to us, we are often told that insanity came on suddenly, without previous warning; but upon investigation we find, almost without exception, that there was a long interval during which the patient exhibited peculiarities and committed strange acts.

Some authors go so far as to declare that the sudden onset of mental disease never takes place, and all agree that it is of the rarest possible occurrence. The duration of the premonitory stage must, of course, depend greatly upon the intensity of the exciting cause and the strength of the predisposition, but it usually extends over a period of months, and sometimes for years before the final explosion takes place.

A young lady was recently placed under my care with a history of having been mentally unbalanced one month or possibly six weeks, but to me she confessed that for upwards of three years she had been greatly tormented by hallucinations against which she had waged a constant warfare, and from the influence of which she was enervated and considerably reduced. This is no uncommon case and did time permit I could cite no end of examples, but I must proceed at once to the object of this paper, namely, to point out a few early indications of mental disturbance. A description of all its varieties would be a difficult task

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and a severe tax upon your patience. I will, therefore, confine myself to the more salient points found in a few *common* mental disorders.

I think no one, in these days, will question but that insanity is a manifestation of some physical derangement going on in the brain, or some distant part of the body affecting sympathetically the material organ of mind.

Wynter says: "The more the fact of the physical nature of insanity is acknowledged, the more it is recognized as an ailment which can be reached by physical agents, the greater will be the chance of its successful treatment."

If a man shivers and feels depressed, he seeks the advice of his physician that he may meet the coming fever with the best resources of his art.

If a man feels his brain disturbed, if he feels the early warnings of which his friends as yet know nothing, would it not be equally wise of him to summon the aid of medicine before it is too late? If such a mystery were not made of mental disease, it would be deprived of half its terrors and half its evil consequences at the same time.

Dr. Winslow declares that in every deviation from a healthy condition of the mind the brain is the seat of the affection.

The idea of the mind being disordered independently of physical disease, has no existence except in the imagination of those who wilfully close their understandings to the reception of truth.

Eccentricity, natural or acquired, is perhaps the simplest form of deviation from ordinary mental standards, and does not specially concern us here further than to remind us, that individuals who occasionally go out of the beaten

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path cannot therefore be classed as walking the border line of insanity unless the singularities exhibited should gradually develop into actual delusions, as occasionally happens.

One of the most common and at the same time one of the most important functional nervous or mental conditions with which the profession has to deal is Neurasthenia, a disease even more prevalent at the present time, than when first described by Beard, some twenty or twenty-five years ago, and one which yields the most gratifying results when subject to appropriate treatment in its early stages.

Neurasthenia, like hysteria, is almost endless in its manifestations, and the symptoms so often simulate those of organic disease of the brain and nervous system, that we must constantly be on our guard in endeavoring to arrive at the truth. Indeed, in no disease are errors of diagnosis more common than in neurasthenia; and this is not strange since diagnostic skill of the highest order is often required to exclude structural changes.

Beard thus summarizes the leading points in its pathology and rationale: "Neurasthenia is a chronic functional disorder of the nervous system, the basis of which is impoverishment of nervous force and waste of nerve tissue in excess of repair, hence the lack of inhibitory or controlling power, physical and mental, the feebleness and instability of nerve action and the excessive sensitiveness and irritability, local and general, direct and reflex.

The fatigue and pain that temporarily follow excessive toil, worry and deprivation of food or rest, are symptoms of acute neurasthenia from which the chronic form differs only in permanence and degree.

The varying and multitudinous symptoms that accompany neurasthenia are largely the result of reflex irritation

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that takes place, not only through the ordinary motor and sensory nerves but through the sympathetic system and vaso-motor nerves. These reflex irritations may arise from any part of the body, and may be transmitted to any other part ; but the chief centres of such irritation are the brain, the digestive system and the reproductive system.

The heart and blood vessels through their abundant, complex and sensitive nerve supply, are quick to feel any such reflex irritation from any source. Thus the local and general blood supply of the body is liable to fluctuation, with a special tendency to local passive hyperæmia or venous congestion.

In the eye this condition can be inductively demonstrated. The circulation is thus kept constantly unbalanced, waves of hyperæmia pass from one organ to another under the influence of a myriad of exciting causes. Thus is explained the inconstancy and correlation of the symptoms, the caprice with which they come and go and the substitution of one symptom for another.

Usually after a somewhat protracted period of work involving more or less strain, worry and anxiety, the patient experiences disagreeable feelings in the head, accompanied by vertigo, sick headache, tenderness of the scalp, pressure, heaviness, or an annoying feeling of coldness in the back of the head or over the vertex.

Ringing in the ears is common and sometimes explosions, especially when the patient is in the recumbent position. Specks may float before the eyes, and I was recently consulted by a gentleman who was greatly annoyed by the appearance of spiders slowly descending before his vision. The pupil is usually dilated and abnormally active. A sense of oppression in the chest and a

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sinking sensation in the epigastrium, are symptoms nearly always present; also tenderness of the spine accompanied with a crawling, creeping or burning sensation. The skin is often dry but the hands and feet are cold and wet with perspiration. Hot flashes are not uncommon, attended with slight nervous chills. The tongue is coated, bowels constipated and the patient often feels completely exhausted after defecation. Indigestion and a sense of fullness in the bowels often lead the sufferer to fear that the intestinal tract is becoming occluded with fecal matter, and if left to his own discretion he will take large quantities of physic, thus, of course, adding greatly to his discomfort. Insomnia is nearly always present and what sleep the patient gets is disturbed and unrefreshing. Muscular weakness is common, and notwithstanding the patient may feel equal to considerable physical exertion on rising, he cannot depend upon himself and is usually quickly exhausted.

Occasionally he gets on comfortably in an ordinary routine, but in attempting something new finds himself quite incompetent.

Brain work is particularly trying to this class of sufferers and often causes actual distress. A bookkeeper, who applied to me recently, declared that the thought of adding a column of figures exhausted him more than a day's work when he was in health. He loses confidence in himself and has great difficulty in concentrating his mind on any particular train of thought. He is depressed, hypochondriacal, introspective and believes himself to be the victim of an incurable malady. Unimportant symptoms are dwelt upon until exaggerated out of all proportion to their importance.

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A clergyman suffering from this disease applied to me not long since, who upon discovering that he had herpes preputialis, became greatly alarmed, consulted numerous works on venereal diseases and dwelt upon his misfortune until he became convinced that he was a victim of syphilis.

The sexual functions are weakened, seminal emissions occur at more or less frequent intervals, and the partial or complete impotence serves as a nucleus about which a whole system of gloomy forebodings are centered.

In the adolescent period of life, *almost all* cases are associated with the sexual system.

In middle life, the symptoms are more physical and less mental; the stomach, liver and bowels are chiefly disordered and the mind of the patient is constantly attracted to them.

In the climacteric period, vasomotor symptoms are more notable, such as irregular action of the heart, flushing of the face, cold hands and feet, hyperidrosis, etc.

I will conclude this part of my subject with a quotation from Beard, who says, "Very many of the signs of neurasthenia and allied states appear in organic affections, and in both conditions they are precisely the same, so that of themselves alone they would be no guide in a differential diagnosis; spinal tenderness; shooting, and stabbing and boring neuralgias; cardiac palpitation; insomnia or drowsiness; failure of memory; sexual exhaustion and involuntary emissions; mental depression; pain and heaviness in the head and back; disturbances of the nerves of special sense; hyperæthesia, and anæsthesia, local or general; coldness of the extremities; twitchings of muscles—all these and other results of the functional nervous disorders we are considering, manifest themselves in spinal

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congestion, in ataxia and muscular atrophy; but in functional troubles they come and go and change about and alternate, appear and disappear and reappear without any clear cause, and sometimes utterly vanish even without treatment; in the nervously exhausted these symptoms fly about from one part or organ to another as from the head to the stomach or back, from the upper to the lower part of the spine, from the front to the back of the head; one day it is the eyes that are troubled; another day the eyes are well and the stomach is complaining as though it would never cease; but in a few hours perhaps, the digestion seems to be all right and the head is suffering, and so on through the whole system."

"The symptoms of organic disease are usually fixed and stable, while very many of those of neurasthenia and allied states are fleeting, transient, metastatic and recurrent."

It is not uncommon for Delirium to be confounded with insanity; but the delirium of acute and sympathetic diseases is different from the disturbance of the intellectuul faculties which charaterizes insanity.

Maniacal delirium is distinguised by the absence of fever, although there is sometimes an increased heat of the surface, yet it is usually confined to the scalp, or may be the result of violent muscular exertion.

According to Dr. Willis: "In delirium the mind is actively employed upon past expressions, upon objects and former scenes, which rapidly pass in succession before the mind, resembling in that case a person talking in his sleep; there is also considerable disturbance in the general constitution, great restlessness, great want of sleep and a total unconsciousness of surrounding objects."

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In insanity there may be little or no disturbance, apparently, in the general constitution; the mind is occupied upon some fixed, assumed idea to the truth of which it will pertinaciously adhere, in opposition to the plainest evidence of its falsity; and the individual is always acting upon that false impression. In insanity also, the mind is awake to the objects which are present. Then again the illusions and hallucinations of delirium are often quickly dispelled by placing a bandage over the eyes, while those of insanity persist.

In judging of the existence of mental derangement we should be guided in our opinion by instituting a comparison between the manifestations which prevail at the time when the mind is supposed to be disordered and the previous mental condition of the individual in its natural state.

When a person of mild temper and gentle disposition becomes subject to fits of violent passion without adequate provocation, when a man naturally virtuous becomes gradually addicted to sensual gratifications, when the kind and indulgent father and husband neglects his family or perhaps treats them with utter indifference, when a man noted for his probity, temperance and business sagacity becomes the reverse, when an ingenuous person of sunny disposition becomes reversed, suspicious, peevish, quarrelsome, and perhaps forms an aversion to those he formerly held in high esteem, then you may be sure he is in the border land of insanity.

This stage is so vastly important I am sure you will pardon me if I quote an exceedingly graphic description by Prof. George: "Sometimes," he says, "the action of the cause is strong and rapid, at other times more moderate and slow. In the first case insanity breaks out at

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the end of some hours or some days after a state of anxiety and uneasiness, with headaches, sleeplessness, agitation or depression and threatening of cerebral congestion; the patient begins to babble, cry, sing and becomes agitated and wild. He is then often taken for a person in a state of intoxication, and the mistake becomes apparent only after examining the previous circumstances and the duration of the malady. In the other case thought only becomes affected gradually and often very slowly; the patient is generally conscious of some disorder in his intellectual faculties; is beset by new and odd notions and unusual inclinations; he feels himself changing in his affections, but, at the same time, he preserves a consciousness of his condition, is vexed at it and tries to conceal it; he continues his occupation as much as he can; and lastly, as many people do in the first stage of intoxication, he makes every effort to appear reasonable. Meantime his health continues to give way and he either sleeps less or loses sleep altogether; the appetite diminishes or disappears; sometimes digestion is difficult and constipation supervenes. The features alter, and in the female the monthly discharge becomes irregular, scant and at last is suspended. At the same time the bystander remarks something unusual and even extraordinary in the tastes of the patient, in his habits, his affections, his character and his aptitude for business. If he was gay and communicative he becomes sad, morose and averse to society; if he was orderly and economical he becomes confused and prodigal; if he had long abstained from the pleasures of love, he becomes the victim of insatiable desires and either seeks to associate with the other sex or has recourse to disgraceful practices. If he was moderate in his religious and

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political opinions, he passes to an extreme exaggeration in both; if he was open and candid, he becomes suspicious and jealous; if a wife, she regards with indifference her husband and children; the merchant neglects his business; tears and laughter succeed each other without apparent motive; the exterior of candor and modesty gives place to an air of conceit and assurance, which, especially in women, astonishes us. But all these phenomena are less prominent than they *appear* to be here, and unless the individual has been insane before, no one may suspect the nature of the ailment which torments him. All the questions put to him lead to no result except that of fatigue and giving him pain, for the ignorance which prevails in regard to insanity leads the friends to indulge in offensive insinuations, and to charge him with frivolous accusations, from not perceiving that he is under the influence of disease and not of reason. Sometimes the appetite remains unimpaired, or is speedily recovered, as well as digestion, nutrition, etc., and it is in these circumstances that the conduct of the patient gives rise to a host of interpretations on the part of the patient and the public. The period of incubation of mental alienation during which the true state of the patient is generally misunderstood or not appreciated, may last a long time."

Pinel relates that a man who believed his wife to have been ill only six months, the period of invasion of furious delusions, agreed after a multiplicity of questions that the disease must have been going on for fifteen years.

It is often easy to go back months or years in this way, and we finish by discovering that circumstances taken for causes, by friends, are freqnently only the consequences of unobserved disease.

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One of the earliest and most important indications of approaching mental trouble, is insomnia and restlessness during the night; this is always present in incipient mania, but it should be remembered that these patients frequently declare that they sleep soundly and awake refreshed and in full vigor. I hardly need say that this is only borrowed energy and portends speedy mischief. In incipient mania the first alteration to attract the attention may be general exhilaration and high spirits; new ideas, propensities and peculiarities are developed; there is an increased rapidity and expression of ideas, every faculty of the mind is exalted and new ones are conceived never before given expression to. Everything is done by impulse, nothing from reflection. Many things are begun with great enthusiasm, but few are carried out to completion. Short reveries are noted, there is great restlessness and a constant desire to change; he gives expression to quick and hurried utterances, is blustering and authoritative, commanding and countermanding in the same breath; is passionate and irascible, scheming, ambitious and extravagant.

All his business schemes come out far beyond his fondest anticipations; general agitation is noted with watchfulness, suspicion, and a propensity for drink, venery, etc.

All ordinary occupations are executed in a more hurried and less perfect manner, or are wholly forgotten; and there is great confusion of mind, though no positive delusion, hallucination or delirium be yet declared.

He has more or less pain in the head, with throbbing at the temples, giddiness and buzzing in the ears. The digestive function is altered, the appetite is capricious, sometimes increased, sometimes diminished; the complexion changes,

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the secretions and excretions are gradually impeded and vitiated and the patient grows thin. These symptoms may continue the same for some time, but by degrees they all become aggravated, or fresh ones intrude before positive delirium is developed. If these symptoms are suffered to proceed, there is a sense of fullness or distension, or constriction like a band around the head. Noises in the ears become louder, great acuteness of hearing, but attention transitory. There is vertigo ; redness and unusual brilliancy of the eyes ; volubility and an exaggerated emotional state. These are a few of the more prominent symptoms found in the incipient stage of mania and as the active or confirmed stage is so patent to all, I will pass to a consideration of the symptoms of impending melancholia. This disorder usually has a protracted period of incubation during which the symptoms do not differ essentially from those in other varieties of insanity, except that mental depression is more pronounced and the patient is tormented by groundless apprehensions which are seldom found in mania.

Soon the characteristic change in the patient's general appearance and attitude takes place.

There is often marked diminution of nerve energy, accompanied with lassitude and general inertia. The muscular system is relaxed, the gait is unsteady, movements are made slowly and only when necessary. The voice becomes notably subdued and there is a disinclination to talk. At the same time his habits and mode of thought are observed to undergo a change.

He becomes dejected, peevish, suspicious and is disposed to connect everything bad with himself. He shuns the society of those with whom he formerly took pleasure

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and often fancies that his family are lacking in proper respect, or that they may be maltreating him. Everything about him is negative, nothing affords pleasure, he is self-conscious, discontented and ill at ease. He is usually aware that a change has taken place in his moral nature and seeks solitude to hide his infirmity.

If he reads he selects stories of a gloomy cast and is apt to search the Scriptures for passages that confirm his morbid fancies.

He sleeps but little and is annoyed by frightful dreams. There is a sense of weight and oppression about the stomach, accompanied with indigestion, flatulence, offensive eructations, loss of appetite, constipation, etc.

The habit of biting the nails is common, also picking the fingers or any pimple or abrasion of the skin until the parts are sore and sensitive, though the pain is unheeded.

He becomes irritable and oftentimes flies into a passion upon slight provocation.

Some melancholiacs are always discontented and nothing pleases them; others are utterly indifferent, because their attention is completely absorbed in the contemplation of their own misfortune; and others maintain that everything is too good for them.

In all cases of melancholia it is our first duty to carefully investigate the general condition of health of the patient. Hepatic, gastric, or intestinal disease will almost invariably be found, and if promptly removed by appropriate treatment, mental health may, in some cases, be soon restored.

It is impossible here to do justice to the broad and important subject of General Paresis. I will therefore state briefly that the early symptoms are so common to other mental disorders that a diagnosis can seldom be

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made with certainty until the later characteristic symptoms are declared. Insomnia and mental depression with more or less hypochondria are always present in the incipient stage, but the opposite condition of exhilaration and great exuberance of feelings soon follows and continues to the end, with the exception of short intervals of depression, which distinguish a case now and then. Failure of the memory is one of the earliest indications; he forgets his appointments, and often is unable to call old friends by name. In writing he occasionally skips important words. Slowly and insidiously a complete change is wrought in his moral nature, he becomes irritable, fretful, moody, and gives way to excesses and dissipations of various kinds.

His friends will tell you that for some time past he has been guilty of small, dishonest acts, one of the most common of which is theft; and it is noteworthy that he steals openly, and appropriates articles which are of no value to himself or anyone else. He speculates foolishly and squanders his money in a most lavish way, is filled with schemes for achieving the impossible, has unlimited self-confidence and is quite blind to his glaring limitations.

All these symptoms, in an *intelligent* person, may be exhibited in a semi-plausible manner, and his friends do not, as a rule, consider him deranged, though they recognize that an unaccountable change has taken place in his character.

The practitioner seldom sees a case in this early stage, but a little later on, when the characteristic tremor of the tongue and lips, clipping of words, disturbances of coordination, bracing gait, irregular pupils, and

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grandiloquent delusions make their appearance, the diagnosis becomes easy.

In conclusion, it should never be forgotten that in the earliest stages of mental disturbance, patients are as a rule, morbidly suspicious, and keen to observe.

The greatest amount of tact and judgment is therefore demanded on the part of the physician to so conduct his examination as not to convey the belief that mental derangement it suspected; for in committing this error, we at once end our own usefulness and perhaps seriously complicate that of others.

Regarding the treatment of incipient mental derangement, I shall say nothing further than to remark, that there is no "Royal Road" to cure, and the characteristics of each case must be carefully studied and fought upon general principles.

I have touched upon three or four of the more *common* mental troubles which are liable to come under your observation at frequent intervals, and an early recognition of which is of the utmost importance if we would be successful in averting one of the most dreadful calamities that can befall the human mind.

It is our duty to improve every opportunity to educate the public in this matter, and to correct the deplorable custom, which is everywhere prevalent, of ignoring the early indications of mental diseases, and trumping up excuses for slight departures from the habits and modes of thinking common to the individual, until he has drifted far beyond the borderland, and becomes so violently excited or dangerous in his impulses, as to compel the friends at last to acknowledge the truth.

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"If," says Dr. Combe, "an acquaintance with the philosophy of mind were common among educated persons, and the patient had confidence enough in the knowledge and discretion of his friends, to reveal to them the first approach he felt of losing his command of his own faculties, the development of insanity might often be prevented; and in fact, its attacks are in many instances, just so many punishments for our ignorance and neglect."

DISCUSSION.

Dr. J. M. Clarke: Mr. President and Gentlemen:— I have been very much interested in this paper because it is right in my line, and I think perhaps it has also been very interesting to all of you as well, for it has been very extensive. It is a very old subject, and while to discuss this paper in particular would be to take up the different points of the disease which Dr. Lawton has touched upon, and would consume too much time, and more than the society can afford me this afternoon, as the programme is already too long.

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Address in Surgery.

THE RADICAL CURE OF INGUINAL HERNIA.

By J. B. Wheeler, M. D., Burlington, Vt.

Mr. President and Fellows of the Vermont State Medical Society:

Few, if any ailments of a surgical nature are so often brought to the notice of the general practitioner, as hernia, and perhaps there is no other whose palliative treatment, when successful, affords so much relief, and, when unsuccessful, is attended with so much discomfort and risk to life. The perfect comfort which a well-fitting truss affords to a patient with a tractable sort of hernia, is familiar to every doctor, and so, too, is the miserable existence of the unfortunate whose hernia cannot be properly retained by a truss, but destroys its owner's comfort and endangers his life by its frequent descents.

It is with the idea of giving some account of what modern surgery can do for the commonest form of hernia, that I have chosen "The Radical Cure of Inguinal Hernia," as the subject of the address in surgery.

As a rule, a surgical operation is necessary for the cure of hernia, except in young children. In that class of patients, a cure can generally be effected by the use of a

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well-fitting truss, if persistently worn. Among adults, such a result is occasionally obtained, but too seldom to place any dependence on the truss as a curative agent, especially when we consider that the cases in which a radical cure is most to be desired, are the very ones in which a truss is of the least benefit. Operative surgery, then, must do its best to meet the want, and until operative techinque had reached its present state of perfection, the best that surgery could offer was bad enough. The mortality of operations which invaded the peritoreal cavity was so high that a conscientious surgeon could hardly feel justified in advising an operation on a reducible hernia, especially as the cure was far from certain, in those cases which were so lucky as to survive the operation. But since the mortality rate of all abdominal surgery has been so greatly reduced by improved technique, various operations for the radical cure of hernia have been devised, all of which have the low mortality rate, characteristic of modern, as compared with obsolete surgery, and some of which have a percentage of cures which abundantly justifies the operations. It is my purpose to describe briefly those operations which are finding the most favor among surgeons and to state, so far as possible, what may be expected from them in the way of cure.

Radical cure operations may be divided into two classes, those by which the inguinal canal is reconstructed and those by which it is obliterated. The first class is attended with less satisfactory results than the second. Every conceivable method of restoring the shape of the inguinal canal has been tried, but recurrence of the hernia has generally resulted because the surfaces approximated by the sutures were so narrow that the newly united struc-

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tures were too thin and weak to stand the strain put upon them by the abdominal contents. But when the canal is obliterated by sewing it up tightly, more resistance is offered to the *vis a tergo*, and recurrence is not so common.

The operations most commonly performed for the radical cure of hernia are MacEwen's, Bassini's and Halsted's. MacEwen's operation consists in isolating the sac and separating it from the inner surface of the internal ring, and then folding it upon itself until a pad is formed which is pressed into the abdominal cavity and stretched against the inner surface of the ring, thus occluding that opening. The canal is restored by stitching the conjoined tendon to Poupart's ligament over the spermatic cord. Although the canal is not obliterated in this operation, the results are excellent, especially in the hands of MacEwen himself, but they are attributable to the treatment of the sac rather than of the canal.

The operation which is most frequently performed in this country is the one which bears the name of Bassini, the professor of surgery in the University of Padua. The method which he employs is to isolate the sac, ligate it as high up as possible, after laying the inguinal canal open throughout its length, cut away the sac below the ligature, lift the spermatic cord out of the canal and obliterate the canal by stitching the internal oblique, transversalis and transversalis fascia to Poupart's ligament and the transversalis fascia. The spermatic cord is then laid upon the seam thus formed and covered by stitching the aponeurosis of the external oblique to Poupart's ligament.

Dr. Halsted of Johns Hopkins University, has devised an operation similar to Bassini's, but differing from it in the following respects. Instead of ligating the sac, he sews

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it and cuts it away below the seam. He not only lays the canal open, but cuts through the abdominal wall upward and outward from the internal ring, until a point is reached where the muscles are thick enough to afford fairly broad raw surfaces of approximation. He then carries the cord up into this angle of the wound and obliterates the canal by sewing its walls together with stitches which include all the tissues except the skin. This leaves the cord on the outside of the aponeurosis of the external oblique, covered by nothing but skin. With the purpose of diminishing as much as possible the size of the cord and consequently of the hole through which the cord enters the abdomen, Halsted removes all but one or two of the spermatic veins.

The after treatment of these three operations is about the same. The patient is kept in bed, lying down, for three weeks. Some operators let their patients get up at the end of a week, (a plan which has been followed by Bassini himself), but as it is an established fact that healing by first intention is not perfect until three weeks have elapsed, it is safer to keep the patient in bed for that length of time. And I would here take occasion to remark, that if this rule were adhered to in other abdominal operations, we should probable hear less than we do of ventral hernia as a sequel of cœliotomy. No truss is worn after leaving the bed, as its pressure would tend to produce absorption of the cicatrix and weakening of the abdominal walls under the pad. The patient at first wears a snugly applied spica bandage, which may soon be replaced by a well-fitting abdominal supporter. This should be worn for several months at least.

The so-called "open method" of operating, which was a good deal in vogue about five years ago, has been

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practically abandoned. The best example of the open method is found in the operation devised by Professor McBurney of New York. In this operation, the inguinal canal is laid entirely open, the sac isolated and tied off, and then, instead of sewing up the canal, the edges of the skin are quilted to the deeper tissues and the canal is left to fill up with granulation tissue. The result is that the canal is obliterated by a cicatricial mass. After this operation the patient is kept in bed six weeks instead of three, and no truss is worn on getting up.

Although McBurney's operation is easy to perform and as safe as any other, it has not proved to be as effectual a cure as the other methods which have been described. In many cases the cicatricial tissue with which the canal is filled, gradually yields as time goes on and allows the hernia to descend again. For this reason the operation is seldom done nowadays, even by its distinguished originator.

In operating for radical cure, it is important not only to obliterate the canal, but so far as possible to divert inter-abdominal pressure from the internal ring. A small depression of the peritoneum into that opening is gradually deepened by the pressure of intestine or omentum, forced into this little pocket by the frequent, and sometimes violent contraction of the abdominal muscles. The process goes on in this way until a hernia is fully developed. In order to guard against this danger it is necessary in operating to sew or tie off the sac as high up as possible, so as to render the inner surface of the parietal peritoneum smooth and leave no kind of a depression into which the abdominal contents can be forced. MacEwen's operation, which is by far the most successful of any method in which the canal is not obliterated, has always seemed to me to owe

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much of its success to the fact that the pad which is made of the sac not only occludes the internal ring, but, by forming a lump behind it, diverts pressure from that spot, instead of inviting it, as would be the case if any depression of the peritoneum were left there. The highest possible ligation of the sac is especially efficacious when operation for radical cure is performed upon a strangulated hernia. The majority of strangulated herniæ, compared with many of the reducible cases which demand a radical cure, have a narrow canal and a small internal ring, and, if my own experience in operating during strangulation is any criterion, radical cure in these cases does not depend so much on the way the canal is treated as on the height at which the sac is ligated. I have notes of eight cases of strangulated hernia in which a radical cure was attempted either by McBurney's method or simply by high ligature of the sac and suture of the skin wound. All of these cases (except one which was operated on last December) were operated on from two to six years ago, and none of them by the methods most approved at the present day, but none of them have as yet relapsed, though three of the operations were on farmers, one on a teamster and one on a policeman, men who were frequently obliged to make great muscular efforts.

One of the farmers, on whom McBurney's operation was done, was quite an unruly patient and went to work on his farm, long before he ought to have been out of bed. About two months after the operation, he called at my office to say he considered himself perfectly cured. I upbraided him for getting out of bed in three weeks, instead of staying there for six as I had ordered him to do, according to the directions given by McBurney. This rebuke

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did not seem to impress him much, so I went on to tell him that he was still in great danger of a relapse, and that he must be careful of himself and not do anything as laborious as ordinary farm work for a year. He laughed and said he guessed farm work wouldn't hurt him much, he had lifted a barrel of apples into a wagon that morning and never stirred the rupture at all. It has never stirred since, though the operation was done four years ago.

I know that eight cases is too small a number to draw conclusions from, but I cannot help thinking that high ligation of the sac has something to do with their successful results, though if there had been large rings and capacious canals, it probably would not have sufficed without more perfect closure of these orifices.

The mortality from any of the modern methods of operating for radical cure of hernia, is almost imperceptible, if the operation is properly done. This statement, of course, does not apply to operations done during strangulation, for there is always a certain number of such cases in which the condition is so desperate that it is impossible to save the patient's life. But in operations on reducible herniæ, done when patients are in good condition and when there is ample time for all the desirable preliminaries to abdominal operations, there is almost no mortality. MacEwen lost only one case out of ninety-eight, and that from scarlet fever contracted after the operation. Bassini lost a case from pneumonia, fifteen days after the operation, and this was his only death in two hundred and fifty-one cases. Lucas-Championniere reports one hundred and eleven, and Kocher one hundred and nineteen cases, with only one death apiece. Halsted reports eighty-two cases with no deaths, and Coley, of New York, one hundred and

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sixty cases of Bassini's operation with no deaths. Operarions for radical cure then, are attended with the minimum of danger to the patient.

In estimating the success of an operation in curing hernia, it is necessary to take into account the length of time which has elapsed since the operation was performed. How long must we wait after operating before we can be sure that recurrence will not take place? Dr. Coley has investigated this point by examining the records of two hundred and fifty cases of hernia which have been operated on for radical cure by various methods. He finds that while recurrence may take place as late as twenty years after operation, the great majority (eighty-five per cent) of all recurrences occur within a year after operation, leaving only fifteen per cent for all the subsequent time. From this we are justified in assuming that the chances of recurrence are very small after the first year has passed, but until that time it is not well to speak of a hernia as cured.

As regards the prospect of cure of the hernia, the operations of MacEwen, Bassini and Halsted make the best showing. MacEwen's list of ninety-eight cases, all of which had been under observation from one to ten years, includes only one recurrence. Bassini reports seven recurrences in two hundred and fifty-one cases, but one hundred and eighty of them had been under observation from one to four and a half years without recurrence.

Coley's list of one hundred and sixty cases of Bassini's operation shows no recurrences at all, though about one hundred of them had been under observation over a year. Halsted reports fifty-six operations by his method, with no

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recurrence, but in many of these cases, less than a year had elapsed beween the operation and the report.

In this country, Bassini's operation is at present the favorite one. Excellent as are MacEwen's results, his operation in the hands of American surgeons has been less successful than in his own, while Bassini's operation seems as satisfactory to most operators as to himself. It is more often done than Halsted's, because it is a less complicated operation, and has been tested for a longer time.

After this consideration of our subject, the practical question arises: "Is it advisable to operate for the radical cure of inguinal hernia, and if so, what class of cases should be operated on and what class should not?" To the first half of this question, an unhesitating answer in the affirmative can be given. The mortality of the operation is almost nothing, and, as regards the prospect of cure, even if we set aside the results which I have quoted and accept the more conservative estimates of the text-books, which fix the percentage of cures at from fifty to eighty per cent, surely that chance is worth taking when the risk of the operation is so small. It is also to be borne in mind that a hernia which relapses after operation is almost always in better condition and more controllable by a truss than it was before the operation.

In regard to the choice of cases for operation, the patient's physical condition, his age, his mode of life and the size and character of his hernia, must all be considered. Of course no hernia operation, or any other of any importance, should be attempted on a patient who is too feeble to stand an anesthetic. As to the matter of age, before puberty the cure of hernia by the persistent

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use of a well fitting truss is the rule, while after puberty it is the rare exception. Operative measures upon children, then, are unnecessary, unless the truss does not control the hernia, or the child cannot or will not wear a truss, or there is no evidence of a cure after a well-fitting truss has been constantly worn for several years.

The patient's occupation and mode of life frequently have an important bearing on the question of operation. Men of sedentary occupation and habits can control their herniæ much more easily than those who do heavy muscular work. A clergyman or book-keeper might have but little trouble with a hernia which would cause great inconvenience and danger to a laborer. It might, then be necessary for a laborer to undergo operation for a hernia which a book-keeper could comfortably and safely manage with a truss. An operation might also be advisable for a man whose truss controlled his hernia perfectly, but who lived where it would be hard for him to get a new truss at short notice, if the one which he was wearing should break.

As to the character of the hernia, one which is small, easily retained and causes its owner no inconvenience, does not require operation except under such circumstances as have just been mentioned. The danger to life from a hernia of this character is very small, as is shown by the willingness of insurance companies to accept such risks. But if a hernia is large, or painful, or irreducible, an operation for its radical cure ought to be performed. Such a proceeding exposes the patient to less danger than does the continuance of the hernia, and offers a good prospect of cure and an almost certain prospect of improve-

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ment. Finally, it goes almost without saying that all operations for strangulation should also be operations for radical cure, unless the patient is so reduced as to render the least prolongation of the operation impossible.

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The Prostate: Some of Its Acute and Chronic Conditions and Their Treatment.

By L. Bolton Bangs, M. D., New York City, Consulting Surgeon to "St. Luke's," the "City" and "Methodist Episcopal" Hospitals; formerly Professor of Genito-Urinary Diseases in the New York Post Graduate Medical School and Hospital, Etc., Etc.

A man with prostatic disease is in a plight. Although the prostate is a sexual organ, its relation to the urinary bladder is such that it is more or less acted upon by the act of urination. There is no back-door for the escape of urine. This *must* come through the prostatic portion of the urethra, and the more the latter functionates, the more the diseased prostate suffers.

Moreover, congestion of this organ stimulates the sexual nerve centres, which in turn react upon the prostate, and sexual activity becomes an additional aggravation. Also, in some individuals a certain irritability of temper is produced, which no amount of good sense or philosophy can fully control. Brain and prostate reciprocate in their effect upon each other. Therefore, the prostate has no rest, and is heavily handicapped when nature undertakes

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its repair. From the age of puberty onward it is liable to lesion, and the man who escapes without some damage may well rejoice. Consider how simply and easily it may be injured, and for illustration, take a common case. A lad, either from the teaching of companions, or from natural tendency and without the restraint of sensible and proper instruction, becomes a masturbator. He repeats the act frequently or infrequently, according to his temperament or opportunity; but no matter, even infrequence is *too often* and before long he is in a state of chronic sexual erythism. Remember the anatomy, function and situation of the prostate and the subsequent effects of chronic congestion are readily understood. The prostate, then, participates in each erection, it becomes congested in response to each erotic thought, and sooner or later its vessels remain dilated. Even at this stage evidences of disturbance of function and of tissue change are present. The act of urination, although not increased in frequency, becomes lame or hesitating "(*stammering*," Sir James Paget long ago called it) and in the urine, if examined carefully, may be found flocculi or shreds of epithelium from the prostatic urethra. The whole urethra is hypersensitive, the prostatic portion especially so, and were an instrument now passed into the lad his suffering would be severe and possibly produce syncope. At this time his attention is arrested, his conscience aroused, his innate manhood asserts itself, he stops the unnatural habit, and some of his local hyperaemia disappears. But his mind is not at rest sexually. He is alive to every erotic suggestion, a partial erection is excited by trifling things; his prostate remains in a state of erythism, and his lame urination persists. Involuntary emissions now disturb him. Each one is like a

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prick of conscience to him. He would rather walk the floor all night long than have one, and he readily falls a victim to the "remedial institutions" and quacks of all kinds. In the meantime, he has fallen in with a young person of the opppsite sex who is responsive to him and a sort of virtuous calf-love begins. He seeks her society constantly and remains with her by the huor, all the time in a state of partial or complete erection. They go on from step to step, and ignorant of the results, excite each other most wofully. He caresses and fondles her. She permits everything but the sexual act, and to him the effects are disastrous. From some of them he never recovers. His symptoms are now aggravated and increased. Besides the lame or hesitating urination and the flocculi of epithelium, which have multiplied, he has a shorter interval between the acts of urination, and in some individuals even at this period of life, I have seen a few drops of blood follow the urine. He has an aching or sense of heaviness in the perineum, which is irrespective of an associated ache in the testicles, etc., and in regard to which I prefer to say nothing in this paper. His garments are frequently moistened by urethral fluid or thin mucous, and this is especially and copiously so when in the company of young women. Mentally, he is irascible, morbid, and at times in a state bordering on sexual frenzy. Sexual intercourse now seems to him the only relief and to be the cure-all of his miseries. If the prostate be now examined by the rectum a distinct increase in volume will be appreciated. The organ has lost the sense of firmness and vigor which are characteristic of its normal state, and which are distinctly appreciated by the skilled finger. Even soft pressure upon the lateral lobes will provoke a peculiar sensation, as if the

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glans penis were being hammered or pounded, and in some cases an outcry of pain will be caused by the gentlest manipulation.

Here let me remark, that in presenting this subject to you, I am not drawing upon my fancy. The facts presented are the results of many confidences drawn out by careful questioning, and minutely recorded at the moment. I have adopted this narrative style not only to lay before you causes and symptoms, but to emphasize more strongly, if possible, the relation which I believe exists between the prostatic disease of mid-life and of old age and ignorance and errors of youth. You, as scientific men, will readily make the practical and clinical application.

From this point onward there is a divergence in the course of these cases, according to the moral status of the individual.

Let us take the case of a boy, who, restrained either from good morals, timidity, or for want of opportunity, does not fornicate. He is among those who in after life come to you with prostatic disease, and says, "Doctor, I don't understand it. I never had any venereal disease. I never even had intercourse till I was married, and now look at me." The doctor himself does not understand the etiology, unless he has been able to follow such cases as I am now describing to you. But when, by your questioning you remind him of his youth, of that period in his *development* when by repeated excitation (whether he had previously been a masturbator or not) over activity of his prostate had been caused and finally certain symptoms had resulted, he does come to understand, with you, the relation of cause and effect. To proceed, the indulgences

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which I have been describing are persisted in, but college or business life intervening they are forcibly (happily) restricted in number and duration, and the boy gets freedom from the acuteness of his symptoms. If now he remains continent in thought and deed, the congestion gradually subsides, the swollen prostate reduces, and even the lame urination disappears. But, unfortunately, the reverse is too often the case. A habit, easily gratified, has been formed and in vacation times or hours of social relaxation, it *is* gratified, at least, enough to maintain prostatic hyperaemia, and from time to time its effects are aggravated by alcohol and tobacco. Now he really becomes engaged to be married, and happy is the one of these subjects whose circumstances permit speedy marriage. For during the period of engagement (or "keeping company") many of the foregoing circumstances, with their accompanying conditions are renewed, the prostate loses its vital resistance, and tubercular or other infection may readily take place. He is now married and the presupposition would be that this physiological state would gradually relieve the hyperaemia and cure his symptoms, and so it does to many who either through good advice or by the application of common sense, arrive at a suitable sexual hygiene ; but even these go through a period of feeble erection, premature ejaculation and urethral irritability before sexual equilibrium is attained. Or, the measure of *sexual rest* which the advent of a child brings both parties (to the husband as well as to the wife) may be the quieting and curative agent, and in the presence of comfortable health these individuals soon forget the distresses of boyhood. But let us follow the man whose marital relations are either excessive or unnatural or both. Excessive, in the sense of too

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frequent, is usually the rule and not the exception in early married life, and if the individual starts in with a hyperaemic prostate, it requires very little argument to show that the latter is easily maintained and even augmented. Normally, the intervals between the acts of coitus should be long enough for the dilated vessels to recontract; for the nervous system to recover from the reaction which follows such a demand upon the vital forces, and for a sense of general well-being to be maintained. This healthy interval will vary with the individual, i. e., according to his age, temperament, nervous susceptibility and his recuperative power at the time. After collecting the experiences of a large number of men, with healthy minds, I am led to believe that for the *average* man (certainly, among what is termed "the higher classes") the act should not take place oftener than *once a week*, possibly twice in that period may not be injurious, but oftener than this there is no season of rest for the sexual apparatus, including its allied parts of the nervous system, and the blood vessels remain dilated. Thus, in response to an increase of function there is increased nutrition and growth of the anatomical elements of the prostate. This begins, insidiously, advances according to the activity and persistency of the cause, and may not manifest itself by symptoms for several years. But the prostate, because of its relation to the testes, (the latter in turn, being related to the sexual centres of the brain), being especially liable to variations in its circulation, only a moderate additional irritation is required to produce those changes in the tissues which we call "inflammation." The latter may take place at any time, may subside or moderate, or be chronic from the outset, and all the time growth may be going on.

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Suppose the man who we are now considering does not wish children ; or, his wife being one of those women who, having learned that "only fools bear children," or one who, thinking only of the responsibilities and not of the joys of motherhood, requires him "to do something to prevent conception." In response to these requirements he establishes the custom of "withdrawal," or "pulling out," or "conjugal onanism." Coitus is therefore unphysiological and never satisfactory. He is in a perpetual state of hanker. Hence the act is frequently repeated, always under the same circumstances, and presently the evidences of damage to his prostate make their appearance.

The same result comes to the man who is married to a woman with some nervous or physical impediment to coitus, which she positively refuses to have removed ; and also to him who is married to one of those ethereal souls who have been taught that sexual desire is "*lust*," who marries with the idea that children are generated by man and wife simply occupying the same bed, and that the physical contact of coitus is "carnal and sinful," which she therefore refuses. (I am quoting from a case in my own practice, gentlemen.) This unfortunate man, with normal, healthy, *honorable* reproductive craving, which is continually aroused and stimulated by the presence of his wife and by her demands for his love and caresses, is tormented by ungratified desire, by prolonged but useless erections, and sooner or later by an overloaded, heavy, aching prostate. This may go on for years with very little disturbance of the individual's general health excepting when some more acute intercurrent exciting cause supervenes. But later on in life, this middle-aged man becomes aware of the fact that his urination is not so easy

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as formerly; perhaps he urinates oftener, but there is no pain or distress associated with the act and he pays very little attention to it. It is possible even at this period, that he gets up once or twice at night to empty his bladder, as he thinks, but he has no particular distress, and considers himself as well as ever. Still later, he observes that at times there is an urgency to urinate; that when he undertakes it, the stream will not start at once, but after waiting and straining a little, and pumping with his abdomen, the urine begins to dribble, the stream sometimes annoying him by curling up on his penis or by simply falling down between his feet, wetting and spattering his clothing. After a few seconds, however, the stream becomes established and he may urinate as freely as ever. Thus he goes on till after some trifling accident, such as wetting his feet, or unusual ardor in the sexual act or after a long railroad journey, he may be alarmed to find that he cannot make any urine at all. He does not understand it, and as hour after hour goes by and the urgency to urinate increases without his being able to pass a drop of urine, a new terror is added to his misery. Now the doctor is summoned, who passes a catheter and makes the diagnosis of an "Enlarged Prostate."

Another individual who is getting on in life and who also finds himself urinating with greater frequency than in youth, flatters himself that because he is urinating a great deal he must be having an "abundance of health" for a man of his age. But after a while he is mortified to find that the urine passes away from him at night, continually wetting his clothing and bed, and he is a nuisance to himself and his family. Some one tells him that he has "incontinence of urine," and administers to him Lithia

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water or sweet spirits of nitre ; or perhaps he consults some friend, who recommends Warner's Safe Kidney Cure or any of the vaunted diuretics, which he faithfully tries ; but the result is not to reduce the obstacle, but simply to increase the volume of fluid in his already overloaded bladder.

Another individual, besides the frequency, has positive dysuria early in the course of his mid-life, and suddenly finds blood in his urine.

So, one might go indefinitely multiplying cases which, varying in their manifestations according to the degree and form of growth, and to the amount and degree of inflammation present, are but types of the protean disease which we call "*Enlargement or Overgrowth*" of the Prostate.

Now, I am not prepared to take the absolute position that *all* cases of prostatic enlargement, (of course, leaving out tumors) are due to a preceding life of sexual hyperæmia ; nor am I ignorant of the fact that this form of cause has been discussed long ago ; but, I have enough cases on record, carefully examined, and from whom I have got clear and positive histories from boyhood upward, to warrant me in suggesting to you a line of observation which in the future I hope may lead to clearer ideas in regard to the etiology of this disease.

There is another and large class of cases to which reference should be made, because in it we may easily overlook the important factor of sexual hyperaemia. In these persons the inflammatory element predominates; the posterior urethra participates strongly in the symptomatology, and gonorrhæal infection pervades the history. They are generally young men, 40 or under, and, satisfied by the

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history which they frankly give, we are apt to neglect the questions which would develop their sexual habits. Many of them suffer extremely. Usually in the best of general health, they are tormented and *angered* by their local malady. (They remind me of a skittish horse with a chestnut burr under his tail.) They complain of a dull, aching, heavy pain over the pubes or along the perineum. Sometimes they are startled by a sharp, darting, neuralgic pain in the perineum or in the pelvis. A persistent, unceasing, burning sensation they locate vaguely "at the neck of the bladder," in the perineum or at the anus. They rarely urinate with comfort, often too frequently and urgently, and at times the end of the act is accompanied by an aggravation of the dull, perineal ache. Coitus produces this aggravation, and may be accompanied by a sharp pain at the time of ejaculation. Generally there is no urethral discharge, but flocculi will be found in the urine and long after—years after—the disappearance of all infection, the individual is being reminded of old times. Sometimes, not often, a little blood will follow an act of urination, especially if there has been sexual indulgence within a short interval. The posterior urethra is excessively sensitive to exploring instruments, and when the mucous membrane is inspected by the endoscope, it will be found hyperaemic and bleeding easily. Per rectum, the physical conditions of the prostate will be found to vary somewhat with the individual. In a typical case, it will be felt evenly and smoothly (no nodules) enlarged in all directions with its conical apex full and more rounded than normal, near to the inner edge of the anus. The central fissure is almost, if not entirely, obliterated. The lateral lobes are distinctly tender to pressure, and the latter may

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provoke and intensify the aching, or fullness, or peculiar sense of discomfort in the penis or perineum, of which these subjects complain. Pressure at the extreme posterior border in the median line may also cause an aggravation of the sense of burning to which they are subject; and, as the exploring finger is drawn from behind forward along the median line, the patient may not only complain of the usual desire to urinate, but of an impending seminal ejaculation. It is possible that associated with the damage which has resulted to the prostatic parenchyma and urethra there may be an inflammation of the seminal vesicles as well. But it should be remarked that many of the local and neurotic symptoms which have been enthusiastically referred to inflammation of the seminal vesicles cannot reasonably be attributed to the latter organs alone. They belong to the sexual apparatus, are appendices to the prostate, may participate in the lesions of the latter, and must not be overlooked. In some of these cases sterility results from occlusion, perhaps of the seminal ducts, but the difficulty, in my opinion, is chiefly in the prostate, for I have treated the prostatitis without any regard to the seminal vesicles, have obtained cure of the symptoms and impregnation has followed.

When we come to the question of treatment, it naturally sub-divides itself into two parts: First, a consideration of that which is applied to acute or sub-acute conditions of the prostate; and, second, a consideration of that chronic condition, with its complications, denominated Hypertrophy or Overgrowth of the Prostate.

Even did time permit, the review of methods of treatment must necessarily be very general. Each individual must be studied and treated according to the conditions

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present, and these will vary from time to time. Of course, if the cause can be ascertained, it must be stopped. If the patient is a celibate, I believe continence is essential and should be insisted upon. In the married, natural, physiological and satisfactory sexual intercourse may be allowed. In my observation, it is better for these men, unless the act is painful, to have regular, systematic sexual intercourse than to compel them to abstain entirely.

For the local conditions in the acute stages, as well as for the various reflex sensations, such as pain referred to the ankles or feet, pains down the thighs and in the back, and for the itching of the perineum and sometimes an intolerable itching of the scrotum, much relief may be obtained by the application of heat, such as hot sitz-baths and injections of hot water into the rectum. The water should be as hot as can be borne and should be retained in the rectum as long as possible. In my experience, heat is more beneficial than cold. Years ago cold was applied in various ways, as you may remember, either by a double-current catheter or by the introduction of cold into the rectum. Within a year a very ingenious and cleanly method of using cold in the rectum has been recalled to the attention of the profession by a Dr. Wiener of New York. If you will analyze his cases you will find—at least, in my opinion—that more benefit was derived from the urethral measures, which in every case he was obliged to institute, than from the cold applications in the rectum.

In the majority of these cases there is more or less urethritis associated with the prostatic inflammation. Local treatment, both to the urethra and prostate, is necessary. The careful, gentle introduction of a sound in the prostatic urethra, preceded by hot irrigation of the urethra, and

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sometimes accompanied by iodoform emulsion,or aided by a solution of cocaine, is usually my first step. Subsequently applications of silver nitrate applied directly to the prostatic urethra may be instituted. If gonorrhœal infection is added to or is the cause of the prostatitis, it requires in its declining stages the use of strong solutions of silver nitrate carefully and persistently applied.

Here let me caution you that your object is to produce an alterative effect, not a cauterizing one, and, therefore, the solution should be weak. More benefit will be derived from a solution 1-1000, applied not oftener than once in five or six days, than from any of the more cauterizing solutions.

Another and very important aid is massage of the prostate, of course through the rectum. I find that alternate pressure and relaxation upon the body of the prostate certainly aids in emptying the over-dilated vessels, and with the other methods produces a gradual alterative action. But massage should not be instituted until the more acute symptoms have subsided. I may say here that this massage of the prostate was suggested to me by the effects which were obtained in the female by massaging the uterus and its appendages. This, in my hands, bears no relation to the so-called "stripping" of the seminal vesicles of which we have all heard so much within the past year or two.

The treatment of enlarged prostate properly resolves itself into two forms, the palliative and the radical. Here again I am met by the dilemma of either making this paper too long, beyond the bounds of propriety for such an occasion as this, or of speaking in the most general way of the treatment of this condition.

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It should be observed that beside the large number of men with enlarged prostate who give no symptoms, another proportion may go through life with only palliative treatment and perhaps never require any operation whatever. Such a statement may be modified by the condition of the individual, and by the stage of the disease at which he presents himself, and by its progress. There are men whose tissues are immune and indifferent to the inroads of microbic bodies. For example, I know a man eighty odd years of age, strong and active, who never makes a drop of urine spontaneously, who carries his catheter in his hat, and in the absence of any more suitable lubricant, spits upon his catheter when he wishes to urinate. But such men are the exceptions, and constant, minute care is required as to the details of palliative treatment or catheter life. This is especially true when you are called for the first time to the middle-aged or old man with retention of urine or with an overloaded bladder which is relieving itself into his trousers or the bed-clothing, and where for the purpose of diagnosis or for the purpose of immediate relief it is found necessary to pass the catheter. Under these circumstances it should be steadily kept in view, that a bladder which contains residual urine is more likely to become infected than a bladder which habitually and naturally obliterates its own cavity. Therefore, every antiseptic precaution which is known to surgery should be instituted, and the patient and his friends should be informed that the passage of a catheter, under these circumstances, is an important surgical procedure.

At this point, there is a method which I would suggest to you, which has proven in many cases,—not in all, I will admit, very useful in my hands; so much so that when on

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duty at St. Luke's Hospital, my House Surgeons understood it perfectly and always tried it before passing a catheter. That is, the patient being in bed, with the pelvis elevated, a high enema should be given and then the urethra irrigated, by way of the meatus, with hot boric acid solution and this repeated in an hour or two. Sometimes, in some of these individuals, you will see a fine spurt of urine follow the irrigation, with evidence of relief on the part of the patient. This does not succeed in all cases, but should be tried first; subsequently, the catheter may be used and regular systematic catheter life be entered upon, if necessary.

It may be well to say a word or two in regard to emptying the bladder at the first sitting. Although so high an authority as Dr. Keyes of New York, does this with an antiseptic procedure of his own, I am inclined to agree with those who object, and recommend a gradual, systematic emptying of the bladder by taking a few more ounces from the bladder at each succeeding sitting. I believe that this is less than liable to produce a condition of shock, that the relief to the pressure upon the bladder wall is gradual and not sudden, and that the back-pressure upon the kidneys (which are doing their work under tension) is also relieved gradually and not suddenly. In these elderly men, trifling things are apt to produce acute congestion or attacks of prostatitis in this chronically enlarged state. These conditions may be treated as I have indicated to you when speaking of acute or subacute prostatitis.

Now, when we come to the question of operative or radical treatment, I am obliged to premise that there should be a discrimination made between the men who belong to the higher classes, and those of the lowly and poor and uneducated. If you look through your experience with prostatic

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cases you will find that a large proportion of those who have been forced upon catheter life and get along comfortably, have that comfort because of their *comfortable* surroundings, because of their training and education, which has given them intelligence and a certain amount of tactile skill. They are able to pass the catheter and to understand your minute directions as to asepsis and the care of the bladder, and as long as these conditions can be maintained, any operative procedure is contraindicated. But, even among the intelligent and well-to-do, cases will arise which demand some operative relief. It is very different with the men who have no education, no continued home, who rely upon a day's labor or who are the parasites upon the community, and who resort from one hospital or dispensary to another. These individuals are of no use to themselves or to society; they are unable to care for themselves, and upon them we must attempt radical relief by operative procedure. This, I think, is the experience of all men who do hospital work.

Heretofore, the choice was generally between drainage, either temporary or prolonged, and some form of prostatectomy. Drainage certainly presents a means of easy and speedy relief to present suffering. The individual has no violent or dangerous attack made upon his pelvic organs, the shock is not very serious, and in some cases,—after prolonged drainage, there is a certain amount of spontaneous urination. In those acute, serious cases, which are showing symptoms of uraemia because of the back hydrostatic pressure upon the kidneys, I would commend it to you rather than repeated aspiration of foul, purulent, infectious urine. It can be done with local anaesthesia, and on several occasions, *in extremis*, I have simply made use of a long trocar introduced quickly and easily behind the pubes, left it in place, and run a

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bistuory down by the side of it until an opening was made through which a drainage tube could be inserted, from which purulent urine flowed quickly, and the use of an antiseptic solution followed at once.

PROSTATECTOMY, or the operation of cutting out the whole of, or portions of the gland, needs but brief mention. The subject has been ably presented from time to time, and the cases in which it shall be selected will have to be decided by the good sense, skill and experience of the surgeon.

My earlier operations were done by means of scissors and prostatic rongeurs, but of late the operation has been modified, and I think greatly improved by Dr. Nicoll of Glasgow, and by Dr. Samuel Alexander and Dr. Eugene Fuller of New York. I have not yet had an opportunity to do this modified operation, but I have witnessed it and seen its results, and it seems to me in every way commendable. Although a number of operators have had a few successive cases of prostatectomy, which resulted successfully, when the cases of all operators are put together, the death-rate is still very high,—from 20 to 25 per cent.

We have now another operation of choice, and to an American surgeon, Dr. J. William White, of Philadelphia, Pa., we are indebted for its suggestion and its organization. His experimental and clinical work have been recently laid before the profession, and although its results are not yet positive, I think it is but fair to say that enough testimony has been advanced for me to believe that there are many cases which will be benefited by the operation of double castration. Being one of those who have taken a conservative and critical position in regard to it, I take this opportunity to pay a tribute to my friend, Dr. White, and of saying to you that at the last meeting

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of the American Association of Genito-Urinary Surgeons, over which I had the honor to preside, he presented the whole subject so thoroughly and in such a candid manner, that I believe it entitled to the most carefnl and discriminating consideration. He reports an amelioration of symptoms in 83 per cent. of the cases operated on; but, the death-rate which he gives, namely, of 7 per cent., I confess surprised me. No doubt this will be reduced as experience is gained. But the question which will be presented to us as practical men, and which we will have to consider with great care, is his: Which will be the cases to be benefitted by the operation of double castration? And before deciding in a given case, it is well to bear in mind that there are still some doubtful points in regard to the relation between the testes and the prostate, some of which were brought out in the discussion upon Dr. White's paper. I agree with Dr. Cabot, of Boston, that the operation is so easy and the relief following it has been so enthusiastically stated, that it becomes very seductive, and we are liable to be placed in the same position as the profession was during the early days when ovariotomy was too frequently resorted to, as we all know.

In conclusion, let me again call your attention to the statements which I have made, that enlargement of the prostate begins earlier than we have supposed. That in many men it bears a distinct relation to sexual hyperaemia, and although I can only suggest this method of observation to you, I believe that if the profession will carefully observe their cases, obtaining an accurate record of each man's sexual history from boyhood up, we will be able to arrive at a *prophylactic treatment* of Enlargement of the Prostate which will settle the question of future generations of men.

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Antitoxin Treatment of Diphtheria.

By Edward R. Campbell, M. D., Bellows Falls.

Mr. President and Gentlemen :—

Perhaps it is safe to say that during the past year no subject has received more attention from the medical profession than serum therapy, especially in relation to its value in the treatment of diphtheria. While it is true that we who practice in the country have not individually the large number of cases to report that our city friends see in their great hospitals, I believe that collectively this society can, if each member will report his carefully watched cases, collect statistics at least equal in value to those given us by our hospitals. The loss of a little patient nearly a year ago of membranous croup under the old methods of treatment, and noticing some reported cases shortly after where treatment with the antitoxin had apparently saved life, led me to investigate. I first wrote Dr. Caverly, the efficient president of our State Board of Health, who replied that owing to the fact that Rutland had been quite free from diphtheria for some time, he had had no personal experience with the remedy. Having met Dr. Durgin, President of Boston Board of Health, at

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the meeting of American Health Association, I took the liberty to write him in regard to the matter, with much the same result, he saying that he had had no personal experience but from his acquaintance and conversation with some of Boston's physicians who had commenced to use it, he had much confidence in the remedy. I immediately procured a vial of Behring's strongest serum, and in February last tried it for the first time. We were at the time having several cases of tonsilitis and when I first saw this case I thought it might also prove to be tonsilitis, but within the next forty-eight hours a large amount of membrane made its appearance and the temperature rose to 104°. That evening I injected about 600 normal units of antitoxin; there was no further disturbance, and within twenty-four hours the temperature was less than 100° and the membrane was commencing to disappear and was practically gone within three days. The father, about 46 years of age, was given 400 units to produce immunization. For a few days he suffered slightly from a local urticaria but no other abnormal symptoms presented themselves.

The third case was a child about five years of age, seen in consultation, who had been sick nearly a week with diphtheritic croup—and was in a moribund condition. It died about five hours after injection. A younger child in the same family, which had considerable hoarseness, was also injected with between four and five hundred units, and within twenty-four hours the attending physician reported symptoms of improvement and the child recovered. Within less than one week I was called to see two children aged seven and nine, one of whom had been ill several days. The younger one, who had been sick at least four or five days, was what we should term a severe case.

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The serum sent for not having arrived, I used the usual remedies, and for three days the cases seemed to be doing so well that I did not use the antitoxin. But one morning I found the younger child hoarse and breathing hard, considerable stenosis being present. I immediately used 600 normal units of the antitoxin in this case, also 400 in the other. I also used for immunization 200 and 300 units in the case of two younger children who could not easily be isolated as there were only three small rooms on that floor. I saw the case three hours later and the symptoms were more alarming; in the evening there was apparently no change, and at midnight the family thought there was but little hope as the child was literally "gasping for breath" as they expressed it. But shortly after there seemed to be a change for the better and in the morning the patient seemed more comfortable and continued steadily to improve. For several days there was considerable albuminuria in this case. A second injection of 600 units was made twenty-four hours after the first serum was used.

Case nine was a woman in rather feeble health who was injected within twenty-four hours after diagnosing the disease, and who made a slow recovery. The dose here used was about 600 units of Behring's serum.

Cases ten, eleven and twelve were where it was used in children in this family to procure immunization, with no abnormal symptoms.

With the exception of the one fatal case the others remain in good health, and for the past four months I have seen no diphtheria, so that my experience is complete with the dozen cases.

After giving our individual experience the next question that naturally arises is, what the profession as a whole

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think of the remedy. Dr. Kellogg, chairman of the Section on Practice of Medicine, said at the last meeting of American Medical Association, "It is with the utmost caution that I approach this latest form of medication. The past year has brought forward a theory and practice which is either a tremendous farce, or the greatest discovery in any branch of medicine since Jenner, in 1798, proclaimed to a plague-stricken world the greatest scientific discovery ever made by man." Most of you are probably well aware that Virchow has been one of the most persistent critics of the so-called bacteriologist, hence his testimony in regard to the serum treatment for diphtheria is all the more valuable, and at the risk of repeating what you have all seen in the medical journals I quote his words. He says, "Treatment by diphtheria antitoxin was begun last March in the Kaiser and Kaiserin Friedrichs Hospitals. In June and July, (1894) nearly all diphtheria cases were treated with the serum. The results were as follows: In eight weeks 63 cases were treated with a mortality of less than 13 per cent. Suddenly the supply of serum ceased as, unfortunately, the very horses from which the serum was taken died. The old methods of diphtheria treatment had again to be resorted to and the results were in the next seven weeks 109 cases treated with 55 deaths, a mortality of over 50 per cent. This sad increase in the mortality induced the hospital to return to the serum. Immediately there was a change. In the next six weeks 84 cases were treated with a mortality of less than 15 per cent." He further says that "All theoretical considerations must give way to the brute force of these figures."

I gladly quote freely from Dr. Chas. McClintock's excellent summary before the Michigan State Medical Soci-

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ety. In speaking of the serum treatment he says: "It is now a question of facts. It has ceased to be a question of opinion. It is no longer what you or I believe, it is what are the facts?" and then he goes on to state, "With over ten thousand cases treated with this remedy—used by careful, critical, often fault-finding men—probaby 80 per cent. of these cases being reported from hospitals, often the diagnosis made by one man, the treatment given by another and the report made by still another, the larger part of the diagnosis being confirmed by disinterested bacteriologists." He again makes the assertion that it is not now an opinion whether or not the remedy is a success. Then he goes on to say that he "has looked with some care over the reports of the leading medical journals of this country, England, Germany and France, and it is well within bounds to say that an average of all reports made shows a reduction in mortality of over one-half. He quotes Virchow, Roux and others and we can do no better than to also give some of their conclusions. Dr. Foster, of Washington, in February last tabulated the report of 7,185 cases, collected from all sources. The mortality of those without antitoxin was 45.56 per cent. while in those treated with the serum the mortality was 18.54 per cent. And he makes the positive statement that "of the cases treated with antitoxin, there was not a single death when the treatment was given in the first day of the disease. When it was begun on the second day the mortality was 2.83 per cent.; begun on the third day 9.99 per cent., on the fourth 20 per cent." Berhings makes the prediction that the mortality will not exceed 5 per cent. if the treatment is begun within 48 hours after the attack. Roux reports that in one Paris hospital the mortality for four years was 51.71 per cent.

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In the six months since antitoxin was used 448 cases gave 24 per cent. mortality and during the same six months, in another hospital in the same city where serum was not used, 60 per cent. died. To show that the medical profession is not unanimous in commending its use I might mention editorials and notes in one of the journals, "Medical Brief," I believe, which severely condemns its use. Also the report of Assistant Surgeon Cordeiro of the U. S. Navy. But perhaps Dr. Winters, of New York City, is the most pronounced in his opposition to the treatment, and he is quoted as making a sweeping challenge of every claim made for serum therapy, and attacked the statistics and alleged a number of serious after-effects due to the antitoxin. His reports were made to the New York Academy of Medicine from observations made at the Willard Parker Hospital. But he is reported not to have had a single supporter at the meeting, and that Dr. Somerset connected with the hospital for the past year or two virtually contradicted every conclusion reached by him, while Dr. Hermann Biggs, Bacteriologist of the New York Board of Health, stated that so far as he knew "there was not a single distinguished clinician, pathologist or bacteriologist in Europe who had not accepted the new treatment of diphtheria as the most important advance in therapeutics in modern times." In regard to such after-effects, Dr. Baginsky of Berlin, director of the Royal Hospital for Children, one of the largest children's hospitals in the world, states that in his opinion the injection of serum does not increase the frequency of nephritis; cardiac collapse occurred in 10.9 per cent. of cases without serum and in only 5.69 per cent. of those treated with it, and that diphtheretic paralysis occurred in 6.8 per cent. of cases where the serum was not

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used and in 5.14 per cent. where it was used. Dr. F. Gordon Morrill of the Children's Hospital, Boston, reports that in 438 immunizing injections given between January 13th and May 13th, 1895, "he failed to observe any dangerous symptoms arise from immunization excepting in one case, a boy, aged two, with leucocytosis and a large spleen, temperature of 105.4 and considerable œdema about the point of injection, cold baths and brandy soon made him better." He also speaks of the occasional appearance of erythema and urticaria. Virchow says, that "Even when disagreeable by effects have proved to occur here and there, they were not sufficient to dissuade him from continuing the treatment." And last, but by no means least, it gives me pleasure to present to you the very recently expressed opinions of Dr. S. H. Durgin, a former president of the American Public Health Association and at present president of the Boston Board of Health.

HEALTH DEPARTMENT,
OLD COURT HOUSE, BOSTON.
Sept. 24th, 1895.

Dr. Edward R. Campbell, Bellows Falls, Vt.

DEAR SIR :—Your letter asking for my opinion in regard to the "Serum Treatment of Diphtheria," is at hand. In reply I beg to say that the effect of the use of antitoxin in the treatment of diphtheria in the Boston City Hospital has been to reduce the mortality about one-half. The last 113 completed cases treated at the City Hospital, and of which we happen to have a report within a few days, resulted as follows. There were 23 deaths and 90 recoveries. Of these deaths at least 15 of the 23 entered the hospital with severe sepsis, which would leave eight deaths

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out of 98 cases that could reasonably have been expected to be cured, which gives a mortality, taking the whole 113 cases, of 25 per cent., whereas the mortality at the City Hospital in ordinary times was over 50 per cent. If we exclude the 15 cases of severe sepsis, we should have a mortality of only 10 per cent.

With the vast accumulation of data showing the remarkable success of this treatment, it seems to me there can be but one verdict on the part of the medical profession. I am a strong believer in the power of antitoxin in diphtheria and also in its immunizing influence on the human subject.

I will enclose an article written by F. Gordon Morrill, M. D., on the "Immunizing Effects of Antitoxin," which may also interest you.

Believe me,

Yours very truly,

S. H. DURGIN, M. D.

Also the opinion of Dr. Biggs, Bacteriologist to N. Y. City Board of Health:

HEALTH DEPARTMENT,
NO. 301 MOTT ST.,
NEW YORK, Oct. 12, 1895.

Dr. Edward R. Campbell, Bellows Falls, Vt.:

MY DEAR DOCTOR:—In reply to your inquiry as to my opinion of antitoxin, I would say that my opinion has never changed since my first full knowledge of this remedy was obtained, about one year ago.

I believe that it is a specific for the treatment of diphtheria when administered early in the course of the disease, that its use has given far better results than any other

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method of treatment, that it is attended with no serious after effects, and that by its use the mortality from this disease may be diminished to at least a third of the average mortality before its discovery. Protection may also be conferred for short periods of time against diphtheria, by the administration of small quantities of serum.

I am, very sincerely yours,

HERMANN M. BIGGS.

From my own limited experience with the antitoxin treatment of diphtheria and the extensive experience tabulated by others during the past year, it seems to me that the "preponderance of evidence," as our legal friends would term it, is very much in favor of the serum, and I have faith to believe that what we now see in serum therapy is the glimmer of the rising sun of progress and not "simply a 'will-o'-the-wisp,' shining to lure the traveler from the true paths into unknown depths."

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Diabetes Mellitus.

By F. C. Morgan, M. D., Felchville.

MR. PRESIDENT:

Gentlemen:—

On account of the complexity of this subject, it is in a very submissive temperament that I consider it before you, but as we all should be working to stimulate the progress of modern research, each member of the fraternity has his ideas and theories and should make them known, in order that in some way by combination of thought difficult problems may in time be solved. Entertaining these principles, I have constructed a theory which may be nothing novel, but somewhat different from what I have chanced to observe.

First, the term Diabetes Mellitus is derived from the Greek which signifies a sweet substance flowing through. We all appreciate the gravity of diagnosis; and certainly in order to arrive at a reasonable decision of the locations of various lesions, it is obvious that the primitive elements, characterizing any bodily or mental derangement, must be thoroughly understood.

With great reverence for our medical forefathers and also modern writers, for their labors to clearly understand

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this subject and cause us to, in a great measure their efforts have been futile and it is not at all wonderful that they should be. Perhaps as much time has been taken in the study of this disease as almost any other unless it be tuberculosis.

Experiments have been made on lower animals and it is barely possible, on some occasions on some of the higher order ; and although the laymen, as we have often heard, are decidedly opposed to vivisection, I feel that in this particular direction, by this means, the shadow of misunderstanding has been partially removed.

One of the great prime factors in the ultimate success of the physician and surgeon is the etiology of disease. Many mistakes in diagnosis, which from the Greek means "to know throughout," have probably been made by all of us, in being in a hurry and slighting the circumstances surrounding the commencement of disease. In consideration that all effects have their causes let us proceed to examine the early portion of this subject. There is no doubt that there are many times hereditary influences governing diabetes, illustrated by its frequent occurrences among the Hebrews ; its appearance in connection with gout and obesity. Climate, also, seems to have a great influence on the disease according to investigations by Purdy, the rate of mortality being greater in cold and moist than in mild and dry regions, and a greater death rate with increase of altitude. There is no doubt that meutal activity is an important etiological factor, as improvement in cases largely depends upon restraint from brain-work. Von Mering and Minkowski have recently demonstrated the close relationship of glycosuria and abnormalities of the pancreas. With entire removal of this organ or disease enough to

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completely impair its function, large quantities of sugar appear in the urine and rapid wasting of tissues, while as discovered by Lepine, with part of the organ removed there is no such effect. From this it is concluded that the destruction of sugar within the body is brought about by a ferment from the pancereas according to Prof. Hare's Practical Therapeutics.

There often exists glycosuria with various nervous diseases also with malaria and syphilis, syphilitic tumors having been found pressing upon the medulla in certain diabetic patients. An unreasonable amount of amylaceous substances ingested will often produce quantities of sugar in the urine, which will lessen and many times disappear after regulating the diet. In this connection we must not confound saccharine urine of diabetes with that before mentioned or after the patient has had a long habit of eating large quantities of sugar, although it is quite apt to be the case that diabetics have a history of being great sugar eaters. I have recently had a case of glycosuria connected with enlargement of the liver. The subject has for the last 25 years eaten freely of saccharine substances, sometimes eating a pound of maple sugar every day during sugar making, or would drink a pint of syrup as we would water. After depriving this subject of carbohydrate food and treating the liver the sugar disappeared from the urine and now he is about his business feeling well.

As I have before mentioned, we understand that pressure or injury to the region of the fourth ventricle of the brain brings on presence of sugar in the urine from experiments on animals and cases of syphilis. But in conclusion of the etiology so far as the books instruct, we needs must say that diabetes has no specific cause, but the main

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stress must be placed upon functional disturbance of the pancreas, mental exertion, trouble about the fourth ventricle, certain diseases and hereditary tendencies.

If the elements in a battery cell become deteriorated from any cause and lose their electro-genetic powers, the telegraph, telephone, or whatever instrument is connected to it by wires fails to operate. There seems to be a synonymous relation between the electric battery and wires, and the nervous system with its ganglionic centres. The action of muscles and vital organs of the human economy depends as much upon the nerve force stored up in the various ganglia and the nerves transmitting this force to their respective destinies, as does the electrical instrument upon the electro-motive force and conducting media from the battery. Consequently let us combine etiology and pathology at this point, if the disease has any pathology, and analyze the condition as follows. We are instructed not to treat the liver or kidneys as there are no particular changes in either unless some hypertrophy of kidneys from overwork, and as the glycosuria is simply a symptom, let us see how it might be allowed an exit per renem. First, we are taught by chemists that sugar is a normal constituent of the urine but in such small quantities that its presence is not easily detected. But the function of the liver I wish to speak of as influencing the presence of sugar beyond the pulmonary arteries. The pneumo-gastric nerve, which is one nerve supply to the liver, especially the left nerve, rises from the lateral tract, behind the olivary body by 8 or 10 fiilaments, and fibers extend to a ganglia at the floor of the fourth ventricle. We would naturally infer that this nerve, having the greatest distribution of any cranial nerve, being disturbed at its ganglionic origin would be-

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come in a measure lacking in nerve force and consequently the function of the liver and other organs supplied by this nerve as well, would be somewhat impaired. The work of the liver is to secrete liver sugar or glycogen and bile. The sugar being absorbed by the hepatic veins is present on the right side of the heart but before returning from the lungs is transformed into some other substance. It is thought by Lehman and Robin to be converted into lactic acid and by combining with the alkaline carbonates to liberate carbonic acid, and this seems very reasonable as the lungs are the organs to dispose of most of the carbonic acid, and as a result of this chemical action lactates of soda and potassa are formed. Now we have various neuroses in connection with diabetes such as neuro-retinitis and I will ask you a question at this point. Is it reasonable or is it unreasonable to suppose that there may exist an atrophic condition of the ganglionic cells composing the origin of the pneumogastric nerve, producing insufficiency of nerve force and thus impairing the action of the liver sufficiently to allow glucose to pass through the circulation of this organ in quantities, unchanged, and this substance being foreign to the blood go on undecomposed to present itself in the urine? I understand that glucose appears in dejections of the body other than the urine, and why should it not?

A peculiar freak in diabetes, so far as I have observed, is the dark color of the stools showing deficiency of biliary coloring matter and even after the administration of cholagogue cathartics the lighter color of feces soon changes.

You of course all know the theory advanced by some authorities concerning pneumic acid of the lungs decompos-

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ing sugars, it being found in the right cavities of the heart and not in the left. We have found in the books and from experience that amblyopia, cataracts, retinitis, and many nervous diseases, beside gradual muscular and mental asthenia, are associated with this disease, and consequently my belief is that the source of the pathological condition lies in the nervous system, especially in atrophic neurosis of the ganglia of the region of the fourth ventricle, although other neuroses may and do coexist.

It would be a natural sequence of a diseased nerve or nerves or ganglia, that organs supplied by such nerves should suffer and that the proportion of the elements in the digestive juices should be thrown out as well as the general function disturbed. Such might be the case in the secretions of the stomach as is indicated by the appearance of the tongue and by the excess of liquor sanguinis thrown off by the kidneys.

In the way of treatment much of my conclusion has been drawn from results of medicines administered to cases. The worst feature against successfully handling this disease is the lapse of time between the probable outset or commencement and the employment of medical services. The first symptoms generally noticed will be frequent urinations and increased thirst, which continue for a long time before the subject thinks anything serious is the trouble. Then he or she will go to the family physician well along in diabetes. From experience with a case which I am treating at present, although he was ill with this trouble nearly a year before I began with him, I find that remedies which stimulate nerve force have beneficial effects. These as we find in text books are phosphorus, strychnia, arsenic and several others. The pyrophosphates

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which have agreeable effects where there are head symptoms in other diseases, work to an advantage here. But the first thing to do is to free the subject of mental work or riding. Put him if possible into a mild and dry climate and deprive him of carbohydrate food such as sugar and starches. Abstinence from this class of substances and adherence to the practice of eating nitrogeneous substances or hydrocarbons of course relieves the liver of performing the glycogenic function and consequently produces diminished quantity of sugar in the urine with lowered sp. gr. of same.

All meats except liver, vegetables devoid, or nearly so, of starch, cheese, eggs and gluten flour are to compose the main dietary. A certain kind of coffee known as Mexican and Jamaica Java in cold infusion is reported to have an excellent effect. As reported in Flint's practice strychnia had the greatest effect in lessening the quantity of sugar voided, of any remedies used, in a case of the late Dr. Frick of Baltimore. We all know the merits of this drug and my belief is strengthened in this case, in the possible nervous origin of the main lesion. Alkaline treatment has proved very efficacious in most cases for a time at least, owing to the supposed deficiency of alkalies in the blood to produce the necessary destruction of sugar. Bicarbonate of soda has been used with good results in large doses, but care should be taken not to give too freely on account of diarrhœa, to paroxysms of which diabetics are subject. The category of remedies which have been employed to benefit this trouble is a long one, but all have been of more or less benefit, especially those of a tonic nature.

Most of the agents we would use to alleviate the general symptoms, it seems to me, are in a large degree a side

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issue as certainly no one known remedy or combination has produced a cure.

In case there is a lack of the elements in the digestive juices, we should supply this, perhaps with lacto-peptine, liquor pancreaticus or whatever is indicated after learning the peculiar requirements of the case in hand. Outdoor air, freedom from mental labor, hot sponge baths followed by friction to the surface, wholesome nitrogeneous diet, administration of a certain amount of alkalies, general tonics such as pyrophosphate of iron, quinine and strychnia, some form of opium, the best which I have tried being codiene in 1-5 gr. doses increased if necessary to ¾ or 1 gr., but the first important attention to be given to nerve food as early in the disease as possible in the meantime stimulating the pneumo-gastric by a gentle current of galvanic electricity, seems to me to be the course of treatment indicated as, if the nerve supply be normal without any organic changes we would infer that normal function would necessarily follow.

The people of the Orient were faithless concerning the existence of the Western continent, but it existed just the same and now we exist upon it; so it seems that the hidden mysteries of diabetes mellitus ought to be clearly delineated by the medical fraternity combined, if not by an individual. My chief object in these imperfect remarks, is, if it is possible for me to do so, to stimulate thought on the question and perhaps aid in advancing a rational treatment for this disease, which may result in lowering the mortality from it. I have thought of the possibility of administering chemical elements or previously combining them with the carbohydrates, starch which is C^6 H^{10} O^5, sugar (grape) C^6 H^{12} O^6, cane sugar C^6 H^{22} O^{11} to render

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them more easily handled by the liver, but perhaps it would be better to abstain from them till the liver function is normal or nearly so, and let it and the adjacent organs work out their own chemistry.

DISCUSSION.

Dr. W. H. Vincent: I would like to report three cases that I have had in charge of Diabetes Mellitus, in the last five years.

One was an old person between 70 and 80 years old. It was a case that we could not follow up diet for, and this case lived only two or three years, because we had to give a mixed diet, the patient being too old and feeble to restrict in diet, and I believe if there is anything that will do any good, it is diet. If there is any medicine that will do any good, I believe it is some form of opium.

Two cases have recovered by following simple diet. Finding that sugars and starches increased the serious symptoms, I recommended an abstinence from all articles of food containing sugar and starch and gave jumble, which was advised by a council of physicians. Whether this was of any benefit in the two cases which recovered, I cannot say, but I think the main thing is diet in treating cases of this kind. These two cases are under observation at the present time and are perfectly healthy. They have been under treatment for a year and a half. They were passing large quantities of water, had lost some fifty pounds of flesh—both were fleshy to begin with. I, of course, treated them on general principles and I am sure I had good luck with them—if it was luck.

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They were both caused by accidents. One was in a railroad accident and was thrown from one end of the car to the other and struck on his head.

In this disease, it is, of course necessary to keep close watch of the patient and see if there are any organs that need looking after.

Dr. J. H. Linsley: Mr. President and Gentlemen. I would like to speak of a test that I have used daily for the past year. It has been spoken of before, that is, Moore's test. It is very simple and very easily done, by boiling two parts liquor potassa and one part urine.

This test serves two purposes, detecting the presence of sugar, and also the amount, evinced by change of color from pale wine to a dark garnet according to the amount of sugar present.

I believe that Moore's test will detect any quantity of sugar which has any significance, and I never use anything else.

Malander's test is also very satisfactory, which detects the presence of sugar by fermentation.

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Blood Stains.

By
Dr. J. N. Jenne, St. Albans.

Mr. President and Gentlemen :

In medico-legal inquiries of suspected homicide it is often of the greatest importance that stains, upon articles of clothing, upon carpets, furniture or implements found in the vicinity of the scene of the tragedy, or upon the apparel, person or the belongings of the suspected person, should be examined by an expert capable of giving to them the widest possible signification consistent with the facts. This ordinarily falls to the lot of the medical expert, and it is expected of him that he shall take charge of whatever articles may be delivered to him by the officer, that he shall retain them in his charge, specifically identify each, minutely describe their appearance, and enumerate all marks, spots or stains, to be found upon them ; he should be further prepared to describe any change that may have been wrought in them by time, exposure, or treatment ; the effect upon them of temperature, moisture and of any other conditions that may have been described as having surrounded the articles prior to their having been delivered into his hands, and the influence of the same and other conditions and influences to which they may have been subjected subsequent to their being so delivered.

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Within the limitations of this paper I shall only attempt the consideration of stains of blood, substances containing it, or suspected of containing it, in the form of a response to the interrogatories:

First. Is the stain blood, or does it contain blood?

Second. If blood, is it blood of man or some of the mammalian race?

These questions are answered more or less perfectly by the results of the application of two or more of three methods of examination, the chemical, the optical and microscopical. The former two have a bearing only upon the determination of the first question, "Is the stain a blood stain, or does it contain blood?" and in no way upon the question of its source. The microscopical test may be relied upon in settlement of the first question only, with certainty, when in the hands of an expert microscopist, and in the examination of specimens known to be fresh blood, if blood at all. Since other bodies or cells are found which correspond in size and contour, and might be mistaken for, the red corpuscles, it is a safer working rule, to first determine by the chemical test the presence or absence of blood, and then apply the microscopical test as verification. While this is not necessary for the absolute and positive determination of the fact of its being blood in many instances, it is in the others. If corpuscular or cellular bodies are found corresponding closely with the red corpuscles in size and contour, the evidence is strengthened in that point by the microscopical examination, particularly, if. in addition, the circumstances surrounding the specimen have been such as to admit of degenerative changes having taken place in them, such as render their

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measurement unsatisfactory for the distinguishment between human corpuscles and those of the mammalia.

In the determination of the second question. "Is the stain of the blood of man?" the microscopical is the only test, and it is based solely upon the discovery and measurement of the contained corpuscles. That it is possible by this means to discriminate between the larger, nucleated and oblong cells, of the fishes, birds and reptiles, and those of the smaller, circular and non-nucleated cells of man and mammalia, there can no longer be a question; but that it is possible to so positively discriminate between the corpuscles of a man and of some of the lower animals whose corpuscles approach closely those of man in size, I must deny.

It will be more convenient and logical to discuss that portion of the subject after we have studied the facts upon which these several tests are based, and I will, therefore, proceed to review briefly the constituent elements of blood which concern us directly in this inquiry. The red corpuscles and hæmoglobin, a constituent element of them in nearly all vertebrates, and of the blood serum in all invertebrates.

The corpuscles in man and the mammalia are described as biconcave disks with round edges and depressed centers, of a diameter in man of 7.75 Mm. or 1'3250 of an inch; their greatest thickness 1'13000 of an inch. Since it is by the size and shape alone that we are able to differentiate the varieties of mammalian corpuscles, it is of the greatest importance to determine with the greatest possible accuracy the normal average diameter of each, particularly those of man and the mammalia the diameter of whose corpuscles approach most closely those of man.

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A vast amount of study and research has been devoted to this subject, and, while the results have shown some divergence of opinion, it may now be fairly stated, that even only within the limitations of health and disease, the diameter of corpuscles of maximum and minimum sizes vary but slightly in any species. The following is the table of diameters of the red corpuscles as given by Wormley :—

Elephant,		1'2738		
Opossum,		1'3145		
Man,		1'3250		
Muskrat,		1'3282		
Monkey,		1'3382		
Guinea Pig,		1'3410		
Dog,		1'3561		
Ass,		1'3620		
Rat,		1'3652		
Rabbit,		1'3656		
Mouse,		1,3743		
Mule,		1'3760		
Rat,		1'3966		
Raccoon,		1'4084		
Lion,		1'4143		
Ground Squirrel,		1'4200		
Ox,		1'4219		
Horse,		1'4243		
Pig,		1'4268		
Cat,		1'4273		
Leopard,		1'4390		
Sheep,		1'4912		
Goat,		1'6189		
Chicken,	l. d.	1'2101	s. d.	1'3436
Goose,	"	1'1836	"	1'3839
Duck,	"	1'1937	"	1'3424
Pigeon,	"	1'1973	"	1'3643
Dove,	"	1'2005	"	1'3369
Turkey,	"	1'2045	"	1'3598

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Quail,	l. d.	1'2347	s. d.	1'3470
Turtle,	"	1'1231	"	1'1882
Trout,	"	1'1524	"	1'2460
Eel,	"	1'1745	"	1'12842
Owl,	"	1'1763	"	1'4076
Pike,	"	I'2000	"	1'3555
Perch.	"	1'2099	"	1'2821
Sparrow,	"	1'2140	"	1'2500

With reference to the element hæmoglobin, it may be said that it is a crystalizable substance with oxygen, nitric oxide and carbonic oxide, but this fact is of no interest in this connection; it is decomposed by heat, with the coagulation of its globin, and the crystalization of its hæmatin. In presence of a bromide, iodide, or chloride the corresponding hæmatin salt is formed. Hæmatin is soluble in alcoholic sulphuric acid and the alkaline hydrates, but is insoluble in ether, alcohol or water. It is further decomposed by conditions of high temperature when combined with moisture, in a recent fresh state, but since it can only in exceedingly rare instances happen that a specimen can have been subjected to the temperature required for the decomposition of both its soluble form of hæmatin, and the destruction of its corpuscles, to an extent incompatible with the recognition as corpuscles of blood, and farther from the limitations of this article, I shall not enter into the discussion of these products of decomposition, their recognition, or signification further than to say that it is possible to submit a specimen of blood to such conditions as will decompose the hæmoglobin, and so far modify or destroy the corpuscles, that both chemical or microscopical tests will fail to dectect the presence of blood when it is present in a specimen; but the chemical and microscopical tests, except as stated in very exceptional, and never

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accidental instances, will reveal all that is sought; the fact of blood and its probable source; with this I will proceed with the details of the two chemical tests, the so-called Guaiacum, and the Hæmatin, or Teichmann's. They are at once the most simple and most commonly used. The former is based upon the reaction observed between the freshly prepared tincture of guaiacum, blood, and ozonized oil, or hydrogen peroxide, the latter the more easily obtained and the cleaner reagent and thus generally to be preferred. A dry stain upon a smooth non-absorbing surface, as the floor, the walls, or a knife, may be removed by scraping with a sharp blade, or if it be an absorbing surface as a garment, by maceration in water, which may then be expressed upon the surface of a clean piece of blotting paper or the fluid may be dropped upon a watch crystal or a shallow earthen dish. A few drops of tincture of guaiacum is added and after that the hydrogen peroxide. The reaction consists in the production of a beautiful and quite characteristic blue color, which only appears with blood, when the reagents are added in the order directed, and it appears immediately upon the addition of the last named chemical. If the blue color is produced in any other way, or before the hydrogen peroxide is added, then the test is a failure, and some of the fallacies that exist in the test should be sought for and eliminated.

It is observed, as I have stated above, a blue color produced only when the reagents are added to the suspected stain in the manner and order directed, is significant of blood; if it appears upon the addition of the guaiacum alone, milk, the juices of some fresh root, like horse radish or starch, gelatine, chloride or an acid or oxide of iron are present in the stain, in the reagents, or upon the

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paper used. The guaiacum, if oxidized, will also give the blue color upon the addition of the hydrogen peroxide alone, no blood being present, so, too, a mixture of these reagents, will produce like results, with other substances than blood. Certain glazed papers into whose composition alum enters, will give to the guaiacum alone the blue reaction. Only tincture of guaiacum from the fresh gum, or the interior portion of the tears should be used, and this only when freshly prepared. A test then should be made first with the reagents alone, and if no blue color is produced, it may then be considered safe to proceed with the test of the specimen. This precaution should always first be taken, particularly, if the stain be a small one, lest the fault with the reagents be discovered only when the material is exhausted. When all these possible sources of fallacy have been carefully eliminated and the test carefully applied in the manner described and the blue color immediately produced, the stain surely contains blood.

Teichmann's test, or the Hæmatin test is the most reliable if not the most easily applied, and is based upon the crystallization of hæmatin in solution in the presence of sodium chloride, potassium, iodide or bromide, with the production of the corresponding salt of hæmatin. The test is performed thus:

A small fragment of the stain is removed and let fall upon a clean microscope slide, a drop of water containing a crystal of potassium iodide is allowed to fall upon it; the water is then slowly evaporated, care being taken not to heat beyond 140 C. A cover glass is then placed over it and a drop or two of glacial (acetic) acid allowed to run under the cover; this heated, but not allowed to boil until air bubbles appear under the cover. It is then allowed to

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cool, when the hæmatin crystals will appear, if blood is present, if viewed through a microscope.

If the specimen has been heated to or exceeding the temperature 140 C. during the test or prior to it, the hæmatin may have been reduced or destroyed, and no crystals will be found; then too, after the addition of the acid, if active boiling occur, the crystals may be mechanically removed from the field and not be discovered.

These crystals are so well known that I scarcely need to devote more time to them than to say; they are rhombic plates, of a dark brown or yellow color; they vary somewhat in size and arrangement depending upon various conditions, influencing crystallization everywhere. They are quite characteristic, however, when recognized and are certain evidence that the stain contains blood from some source. An effort has been recently made to show that these crystals, in the different varieties of apyrenemata vertebrata possess properties which enable the observer to distinguish blood of one member from all other members of the class, but thus far they have been futile. The recognition of the hæmatin crystals signifies the presence of blood, nothing more, but a negative result does not prove its absence, for the reasons already mentioned. The microscopical test, is, as has been stated, based upon the recognition of the red corpuscles, and as between the corpuscles of the pyrenemata and apyrenemata, birds, fishes and reptiles on the one hand, and man and the mammalia on the other, the discrimination is a comparatively easy task; but to discriminate between man and certain of the mammalia, is quite impossible, the only distinguishing feature being size as determined by the micrometer. It happens often, however, that questions in cases of legal inquiry involve only a determination as

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between the corpuscles of a man and that of a certain animal as, for instance, the ox or the horse; the corpuscles of the former 1/4219, the latter 1/4243. Here an expert need not hesitate, but if fairly experienced, may pronounce with certainty, for one or the other, and even between corpuscles with measurements approaching each other more closely, a fairly decisive opinion may be had.

Occasionally the question presented to a medical expert is as to the consistency of the allegation that certain stains of blood are from the chicken, duck, cow, or pig, but he can only in a specific case like this, reply that the microscope reveals facts consistent or inconsistent with the allegations as are the facts found. The microscopical examination applies to the examination of fresh, recently shed blood and the dry stains, but the results of the examination of dry blood, may or may not prove satisfactory, depending upon the conditions surrounding it and connected with its drying. If blood has fallen upon a smooth non-absorbing surface, and has not been subjected to too great vicissitudes of temperature, or particularly moisture, then the examination, even after the lapse of years, is quite as simple and its results nearly as satisfactory as the results of the examination of a fresh stain, or freshly shed fluid blood. If, however, the blood has fallen upon some porous absorbent substance, particularly fabrics, then the contour of its corpuscles is often so altered by their adhesive properties, and the attractive properties of the fibres of the cloth as to render their measurement very difficult, if not impossible.

Stains of fresh blood are usually prepared by placing a drop of freshly drawn blood upon a clean slide and placing the cover immediately over, but often corpuscles show such a disposition to arrange themselves in rouleux, and are so

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closely assembled that many are overlapped or stand edgewise and their measurement is rendered difficult or impossible. It will generally be found more satisfactory after placing the drop on the slide, to place another slide, face upon it, pressing them firmly together so as to diffuse the blood extensively upon their surfaces and then to separate the slides, maintaining them in a parallel position. A cover may not be immediately put on or the blood allowed to dry even by the aid of additional heat, a drop of balsam placed about the rim of the cover will preserve the mounting for several days. The latter method of mounting, diffuses or separates the corpuscles, even to isolation, which greatly facilitates their examination and measurement.

With dry blood, some fluid is required to disintegrate the mass that will not destroy or modify the contour or diameter of the corpuscle. Many have suggested Muller's and Virchows' being the popular ones; the former consists of potassium bicarbonate two parts, sodium sulphate one part and water 100 parts; the latter is 33 per cent. aqueous solution of potassium hydrate. They each are about the specific gravity of the blood serum and both cause contraction of the corpuscles from long maceration in it, equal to 1-3 of the diameter of the corpuscles. These solutions are to be preferred to some others when an immediate examination of the stain is required, as the alkali rapidly disintegrates the dry mass and sets the corpuscles free. A small fragment of the stain is removed from the surface upon which it has fallen, by a sharp knife, and is allowed to fall upon the surface of a slide. A drop or two of Muller's or some other fluid is added, a cover glass placed over and sealed. A sufficient length of time should now be allowed for the par-

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ticles to become wholly disintegrated, which will vary exceedingly, from a few minutes to as many days, depending upon the age of the stain, the surface from which it was removed and other influences to which it has been subjected. It can be examined from time to time until it is observed that the mass is softened, and the corpuscles loosened up, and isolated sufficiently for their measurement. If a stain is from a large spot or from an absorbent surface, that portion of it should be selected which gives evidence of having been the first to dry, as the corpuscles will have been less changed by absorption of water.

Having mounted a specimen of dry or fresh blood we proceed to the measurement of its contained corpuscles in precisely the same manner. The microscope with a movable stage greatly facilitates the bringing of the corpuscles accurately and speedily within the lines on the scale of the micrometer. Since the greatest accuracy is absolutely essential in the securing of even approximately correct results, it should be borne in mind that the eye-piece micrometer can be used only upon the instrument for which it was made, or upon one on which it has been verified by a reliable stage micrometer. The scale in the eye-piece micrometer measures the image of the object formed in the focus of the eye-piece and not the object itself; no two objectors are exactly of the same power, hence the necessity of great care in the adjustment of each eye-piece micrometer to the instrument on which it is to be used, and making the proper correction of readings for each power, and for each instrument. Again, it has been stated, the diameters of the corpuscles of all the mammalia vary within limitations in health, and are also influenced by diseases; fevers, septicaemia, diphtheria to diminish,

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leukacmia to increase their diameter. A large number of corpuscles should always be measured, three hundred or more, and the average of their diameters taken. It is customary to include the dark, outside ring of the corpuscle in the measurement.

Fortunately for the expert, it is never necessary for him to state specifically that the corpuscles of a given stain are of man, or of any specific animal, and if he has placed himself in the position of assuming to be able to distinguish any specified corpuscles, from all other corpuscles, it is his own fault. He is called upon to state only what is consistent with the facts of which he has possessed himself by the examination, and if the fact is consistent with the theory that it is the blood of two, or a dozen animals, he should so state.

If a specimen examined shows corpuscles of an average diameter of 1/3250 of an inch, it is consistent with the theory of its being the blood of the monkey, the Guinea pig, the dog or others; it is not consistent with the theory of being the blood of the sheep, ox or horse, and the medical expert must so state.

If the corpuscles are oblong and nucleated, he may state that it cannot be the blood of man or of the mammalia. If the average diameter be less than 1/4000 of an inch he may state that it can not be from the blood of man, the dog, monkey or rabbit and some others.

The Guinea pig, rabbit and dog are the only domestic animals whese corpuscles closely approach those of man in diameter. If it should be shown that the specimen examined could by any means have been from one of those sources and the corpuscles measured 1/3100 to 1/3300 of an inch in diameter, in a criminal case, that fact is for the

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jury, and not for the expert, and he should make no use of it in forming his opinion or giving his testimony.

Much has been said and written recently respecting the value of higher powers of the microscope in distinguishing the corpuscles of man and the various mammals, but it is to be observed, however, that the conclusions of these writers and observers who claim superior advantages for the higher power instrument, do not materially differ from their former declarations that, if the corpuscles are more than 1'4000 of an inch they cannot with certainty be distinguished from those of man, no matter what the source may have been.

These same results are reached with quite as great accuracy with a 1'12 or even a 1'5 objective in the hands of the other observers. Personally, I have had no experience with the higher power instrument. From my own observation and from a careful perusal of the best and most recent authors, and the conclusions of the foremost hæmatologists such as Bell, Reyburn, Rees, Ewell, Farmand, Masson, Wormley, Wood and White, I am of the opinion that the corpuscles of the blood of man can, in no instance, with certainty, be distinguished from those of certain mammals in the present state of our knowledge.

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Obituary of Samuel T. Brooks, M.D.

By W. J. Aldrich, M. D., St. Johnsbury, Vt.

Mr. President and Members of the Vermont Medical Society:

It is not often that your society and the Medical fraternity at large are called upon to endure so great a loss as has recently befallen you in the death of Dr. Samuel T. Brooks of St. Johnsbury. Few are there, indeed, who have not a personal knowledge of his strong character and his constant endeavor to strengthen and ennoble our profession in this fair State.

For nearly half a century he had practiced medicine with success. What that means the silvered locks before me know far better than I can tell. It means years of hard work in acquiring a knowledge of medicine; it means a period of slow starvation while waiting for a practice; it means thence onward nights broken of rest, days heavy with solicitude and not one hour of the twenty-four to call one's very own.

Such a character as Dr. Brooks deserves more than a passing notice, and if I go somewhat into detail it is because I believe it will meet the approval of this distinguished audience.

Dr. Samuel T. Brooks was born at Stanstead, P. Q., December 28, 1823, and while a mere lad removed with

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his parents to Sherbrooke. He was educated in the schools of that place and at Dartmouth College, graduating from the latter institution in 1847. He then began the study of medicine at McGill College, Montreal, and in 1851 received his degree. Locatitng at his home in Sherbrooke, he practiced his profession until 1862, when he removed to St. Johnsbury, where he resided until his death, which occured on March 13th, last, after a period of two years of failing health.

He was united in marriage June 6, 1855, to Miss Lucy Mills, of Colebrook, N. H., who survives him. Nine children blessed this union, all of whom are living except two, who died in infancy.

Dr. Brooks was one of the oldest physicians in point of service in St. Johnsbury, and his practice was by no means confined to the limits of his home town. His mature judgment and ripe experience were in constant demand throughout northeastern Vermont. He was conservative rather than hasty in his decisions, and he possessed in a large degree that nice discrimination and calm judgment which are so essential to a successful practitioner. He was resolute, truthful, cheerful and sympathetic to his patients. His manner in the sick room was admirable. He knew how to console when consolation was needed, to encourage when encouragement was necessary.

He was a tireless worker and a large reader, and he kept familiar with the latest progress in medicine and surgery.

He was an active and honored member of the Vermont Medical Society and has held with dignity the offices of councilor, vice-president and president. It had a warm place in his affections and he showed his interest and pleas-

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ure in the Society by attending the meetings when it was possible and by frequent contributions from his pen.

Dr. Brooks was a member of the North Congregational Church and one of its deacons for over twenty-five years. He was an ardent disciple of the Great Physician and his professional duties were never allowed to interfere with his church work. No one was more constant in attendance upon all the services than he.

Though in no sense a politician and never holding any political office, he was intensely interested in the welfare of his country and equally interested in the proper administration of town and village affairs.

I like to recall him as he was—a refined, courteous gentleman. Always neat in personal appearance, affable, generous and forgiving, he made a picture that will long linger in the minds of those who knew him.

As a most respected, loved and honored husband and father, as a Christian gentleman, as a skillful and sympathetic physician, as a most worthy citizen of St. Johnsbury, his memory will ever be cherished by those nearest him in his life work.

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TRANSACTIONS

of the

EIGHTY-THIRD ANNUAL MEETING

of the

Vermont State Medical Society.

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OFFICERS.

1896–97.

F. R. STODDARD, President, Shelburne.
M. D. WARREN, Vice-President, Cabot.
D. C. HAWLEY, Secretary, Burlington.
D. G. KEMP, Treasurer, Montpelier.
E. S. ALLBEE, Auditor, Bellows Falls.

EXECUTIVE COMMITTEE.

F. R. STODDARD. D. C. HAWLEY. J. N. JENNE.

PUBLICATION COMMITTEE.

D. C. HAWLEY. H. N. JACKSON. M. C. TWITCHELL.

LICENSE CENSORS.

H. C. TINKHAM. H. H. LEE. C. W. STROBELL.

COMMITTEE ON NECROLOGY.

C. W. PECK. D. F. RUGG. E. M. BROWN.

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TRANSACTIONS

OF THE

EIGHTY-THIRD ANNUAL MEETING

OF THE

Vermont State Medical Society

HELD IN

St. Johnsbury, Oct. 15 and 16, 1896.

The Society was called to order, for its Eighty-third Annual Session, in the Caledonia County Court House, at 10 o'clock A. M., by the Vice-President, Lyman Rogers of Bennington.

Prayer was offered by the Rev. E. T. Fairbanks of St Johnsbury.

The records of the last meeting were read by the Secretary and approved.

Dr. R. J. Thompson of Fitchburg, Mass., delegate from the Massachusetts Medical Society, and Dr. Walter S. Munger of Watertown, Conn., delegate from the Connecticut Medical Society, presented credentials and were introduced to the Society by the chair, and invited to participate in our deliberations.

On motion of Dr. H. D. Holton of Brattleboro, it was ordered that the Committee on Nominations and the Committee on Membership be appointed by the chair.

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The chair named as the Committee on Nominations, J. H. Linsley, E. S. Allbee, E. H. Martin, J. A. Howard, and W. S. Nay, and as the Committee on Membership, J. M. Allen, F. T. Kidder and Hall Staples.

An obituary of Prof. C. P. Frost, late of Hanover, N. H., who was at one time an active and later an honorary member of this Society, was presented by invitation by Prof. Wm. T. Smith of Hanover.

The following amendment to the Constitution and By-Laws, proposed one year ago by Dr. George Davenport of East Randolph, was unanimously adopted.

Resolved, That Sec. I of Art. III of the By-Laws, be amended to read as follows: "Every member of this society, (honorary excepted) shall pay to the Treasurer an annual fee of three dollars."

Dr. F. W. Comings of Derby, presented a paper on "Opium, its Use and Abuse," which was discussed by Drs. J. B. Wheeler, W. H. Vincent and H. D. Holton.

On motion of Dr. D. C. Hawley it was voted that the Committee on Nominations, name five delegates to the British Medical Association which meets next year in Montreal.

Adjourned to 2 o'clock.

AFTERNOON SESSION.

Met at 2:25 o'clock.

Dr. H. D. Holton, chairman of a special committee appointed by the chair on the subject of vivisection in the District of Columbia, reported the following resolutions, which were unanimously adopted.

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Resolved, That this Society does most heartily endorse the protest of the American Medical Association, against the passage of Senate bill No. 1552, entitled, "A bill for the further prevention of cruelty to animals in the District of Columbia."

Resolved, That the secretary be instructed to forward a copy of these resolutions, to our State Senators and to the Chairman of the Committee on the District of Columbia of the House of Representatives, and of the Senate, of the United States."

Dr. W. H. Vincent of Orwell presented a paper entitled, "The management of acute peritonitis from a medical standpoint," which was discussed by Drs. J. B. Wheeler and Henry O. Marcy.

Dr. E. M. Brown of Sheldon read a paper on "Mineral Springs of Vermont, Therapeutic effects, &c." Discussion followed by Dr. J. A. Howard of Alburgh Springs.

"Twelve years practice of Obstetrics" was the title of a paper by Dr. J. Sutcliffe Hill of Bellows Falls. Discussed by Dr. W. S. Nay of Underhill.

Dr. H. N. Jackson presented for Dr. L. M. Bingham, the report of a case of tumor of the neck, with operation.

Prof. J. Henry Jackson of Barre presented the address in State Medicine entitled, "Some observations on preventive medicine."

The subject was discussed by Dr. W. E. Lazelle.

Dr. M. R. Crain reported for the Committee on Legislation appointed last year and presented a bill which he had drawn.

The report was referred to a special committee consisting of W. H. Vincent, E. M. Brown and E. H. Martin.

Adjourned.

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EVENING SESSION.

Met at 8 :30 o'clock with the Secretary in the chair.

The Vice-president, Lyman Rogers of Bennington, presented the annual address in Medicine, subject, "The practice of Medicine in 1858 and 1896.

The Vice-president resumed the chair, after which Dr. Henry O. Marcy of Boston entertained the society for one hour, on "Hernia and its cure," illustrated by 60 stereopticon views.

At this juncture the Society adjourned for the Annual Banquet, which was served at the St. Johnsbury House at 10 :30 o'clock, Dr. J. B. Wheeler of Burlington acting as Anniversary Chairman.

SECOND DAY.

Friday, Oct. 16.

Met at 9 :10 a. m.

The nominating committe reported the following list of officers for the ensuing year and they were duly elected by ballot.

OFFICERS AND DELEGATES FOR 1896-97.

OFFICERS.

President,	F. R. STODDARD,	Shelburne.
Vice-President,	M. D. WARREN,	Cabot.
Secretary,	D. C. HAWLEY,	Burlington.
Treasurer,	D. G. KEMP,	Montpelier.
Auditor,	E. S. ALLBEE,	Bellows Falls.

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EXECUTIVE COMMITTEE.

F. R. Stoddard, D. C. Hawley, J. N. Jenne.

PUBLICATION COMMITTEE.

D. C. Hawley, H. N. Jackson, M. C. Twitchell.

LICENSE CENSORS.

H. C. Tinkham, H. H. Lee, C. W. Strobell.

COMMITTEE ON NECROLOGY.

C. W. Peck, D. F. Rugg, E. M. Brown.

ANNIVERSARY CHAIRMAN.

W. S. Nay.

DELEGATES.

Univ. Vt. Med. Dept., J A. Howard, Fred Fletcher.
Dartmouth Medical College, F. T. Kidder, J. Sutcliffe Hill.
N. H. Medical Society, D. F. Rugg, C. M. Terrill.
Maine Medical Association, F. L. Osgood, H. H. Lee.
Mass. Medical Society, G. H. Gorham, H. D. Holton.
R. I. Medical Society, Henry Janes.
Conn. Medical Society, J. D. Brewster, O. W. Sherwin.
N. Y. Medical Association, E. R. Campbell.
N. Y. Medical Society, W. H. Vincent, Lyman Rogers
Northern N. Y. Medical Association, E. M. Brown.
White Mountain Medical Association, C. R. Gibson.

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American Medical Association, H. D. Holton, D. C. Hawley, E. R. Campbell, H. S. Brown, Geo. Davenport, M. R. Crain, E. S. Allbee, Hall Staples.

British Medical Association, D. C. Hawley, J. H. Linsley, J. A. Howard, J. H. Jackson, J. B. Wheeler.

Medical Society of France, J. N. Jenne.

Voted to hold the next meeting in St. Albans.

On motion of Dr. H. D. Holton the chair was instructed to appoint a committee of three members, to join with similar committees from other societies in this country, should such be appointed, in entertaining members of the British Medical Association while in this country next fall *en route* to or from the meeting of the British Medical Association in Montreal. The chair appointed as such committee Drs. H. D. Holton, J. Henry Jackson and J. H. Linsley.

The special committee on legislation appointed yesterday afternoon, reported, recommending that the society accept the report of our legislative committee to amend the present law and refer the same, together with a bill introduced into the Legislature by Dr. Manchester, to said committee, who shall take action to secure such legislation as they may deem wise.

On motion, Dr. W. T. Slayton of Hyde Park was added to the Legislative Committee.

Dr. D. C. Hawley presented the Address in Surgery, entitled "Diseases of the Rectum." The subject was discussed by Dr. E. D. Ferguson of Troy, N. Y., and Drs. M. R. Crain, J. H. Jackson, E. H. Ross and J. M. Hamilton.

Dr. E. D. Ferguson of Troy, N. Y., read a paper on "A class of fatal cases, presumably due to Intestinal Ptomaines," which was discussed by Dr. M. R. Crain.

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Dr. W. S. Nay of Underhill presented "Inebriety and its Treatment," which was discussed by Dr. F. S. Gray of Troy.

Dr. E. D. Ferguson of Troy, N. Y., and Dr. Henry O. Marcy of Boston were unanimously elected honorary members of the Society.

"The operation of shortening the round ligaments, its indications and technique" was the subject of a paper by Dr. E. H. Ross of St. Johnsbury.

Adjourned.

AFTERNOON SESSION.

Met at 1:30 o'clock.

Dr. E. M. Brown of Sheldon presented report of Committee on Necrology, as follows:

REPORT OF THE COMMITTEE ON NECROLOGY.

In the absence of Drs. Peck and Rugg, the report of the Committee would fall upon me.

Within the fiscal year ending Oct. 1, 1896, death has taken from our ranks four members. The old adage of "Physician cure thyself" can only be materialized when it does not clash with the inevitable laws of nature.

The names of the deceased members are:

Dr. C. P. Frost of Hanover, N. H., an honorary member, formerly an active member, whose obituary has been presented by Prof. Wm. T. Smith.

Dr. Samuel H. Griswold of Rutland, whose obituary has been written by Dr. Geo. H. Fox.

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Dr. Geo. Lane of Ludlow. Dr. Bryant of that town has kindly consented to present his obituary.

Dr. E. K. Baxter, formerly of Sharon, and Dr. A. B. Bisbee of Montpelier writes his obituary.

All of *which* I expect will be presented to the Secretary of the Society for publication.

I am also pained to state that my esteemed friend and associate upon this committee, Dr. C. W. Peck of Brandon, has recently been afflicted in the death of his wife, which he states is the cause of his absence from this gathering at this time, and it seems proper, gentlemen, considering Dr. Peck's high standing in this Society and his position as chairman of this committee, that we extend to him some expression of feeling; therefore

Resolved, That the Vermont State Medical Society extend to Dr. C. W. Peck their condolence and sincere feeling of sympathy in the loss which he has so recently sustained in the death of his esteemed wife.

All of which is most respectfully submitted.

E. M. BROWN,

For Commitee.

Dr. Ross' paper on Shortening the round ligaments was called up and was discussed by Dr. D. C. Hawley.

Dr. J. M. Hamilton presented a paper on "Puerperal Fever," and Dr. J. M. Aldrich of St. Johnsbury one on "The Discovery of Ether."

The last paper of the session was by Dr. F. C. Kinney of Greensboro, entitled "The value of Cimicifuga Racemosa in Pregnancy and Labor."

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REPORT OF BOARD OF LICENSE CENSORS.

Mr. President and Gentlemen of the Vermont Medical Society:

Your Board of Censors has during the past year received seventy applications for license. Of this number sixty-six were favorably entertained and their petitions granted.

The list is as follows:

E. J. Horan, North Troy, Vt., U. V. M. '95.

Allan Davidson, Swanton, Vt., McGill.

J. A. Jules Chevigny, Richford, Lavelle University, Montreal.

E. R. Cook, 109 East 22nd St., New York City, U. V. M., '95.

R. H. Goldburgh, 122 East 105 St., New York City, U. V. M., '95.

W. W. Griffiths, Burlington, U. V. M., '95.

Henry Nelson Potter, N. Y. College of Physics and Surgery, Baltimore, '94.

C. Cole, Burlington, Baltimore Medical College, '96.

John Tus, Montreal, McGill, '96.

R. G. Wissell, Monkton, U. V. M., '93.

Wilfred John LaBreer, Montreal, Lavelle University, '95.

Elzear LaMott, Winooski, Lavelle University, '96.

G. H. Branch, Grand Isle, State University of Iowa.

Walter Parker, Derby, Vt., Baltimore Medical College, '96.

George Roberts, Brattleboro, Vt., U. V. M., '96.

Joseph Amulic, Tuft's, '96.

Walter S. Bates, U. V. M., '96.

S. R. Hutchings, U. V. M., '96.

George W. Libby, U. V. M., '96.

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V. B. Herrick, U. V. M., '96.
H. W. Mitchell, Malden, Mass., U. V. M., '96.
Geo. Austin Curler, Underhill, Dartmouth, '88.
J. M. Stafford, Whallonsburgh, N. Y., U. V. M., '96.
J. H. Bean, Johnson, Vt., U. V. M., '96.
L. W. Burbank, Greensboro, Vt., U. V. M., '96.
E. A. Wilber, Winooski, Vt., U. V. M., '94.
C. F. Morse, Montpelier, Vt., U. V. M., '96.
J. S. King, Isle LaMotte, U. V. M., '93.
I. N. Fowler, Groton, Vt., U. V. M., '93.
A. M. Norton, Bristol, U. V. M., '89.
John A. Peterson, Readsboro, U. V. M., '96.
L. J. Marshall, Morrisville, U. V. M., '96.
H. R. Watkins, Burlington, U. V. M., '92.
S. C. Minor, New York City.
Minora S. Marshall, Montpelier, Union, Mich., '96.
S. A. Chaffee, Philadelphia, U. V. M., '96.
R. DeLis Canedy, Columbia, New York City, '95.
R. H. Blanchard, St. Johnsbury, Bellevue, '96.
R. J. Goss, M. D., Hartford, Vt.
J. L. Nowlan, M. D., So. Strafford, Vt.
W. T. Slayton, M. D., Morrisville, Vt.
G. C. Goodwin, M. D., Johnson, Vt.
J. E. Fish, M. D., So. Royalton, Vt.
H. C. Ide, M. D., St. Johnsbury, Vt.
H. S. Chaffee, M. D., Rochester, Vt.
Carson A. Smith, U. V. M., '95.
Charles A. Browne, Baltimore Medical College, '95.
Grosvenor L. T. Hayes, Univer. Episcopal Col. Can., '95.

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Walter C. Mathiews, Baltimore Medical and Surgical College, '92.

Edwin M. Nichols, Baltimore Medical and Surgical College, '95.

Joseph J. Mahady, Baltimore Medical and Surgical College, '93.

Schuyler W. Hammond, U. V. M., '95.

Watkins W. Griffiths, U. V. M., '95.

Edwin Van G. Baldwin, Albany Medical College, '95.

Jaques J. Trudel, U. V. M., '86.

Laura M. Fairchilds-Plantz, Penn. University of Medicine, '60.

Edward A. Robertson, Col. Med. and Surg., Quebec, Can., '91.

S. H. Wollerton, University of Pennsylvania, '80.

Arthur V. Dowd, University of Michigan, '95.

Samuel Houston Rogers, U. V. M., '93.

J. E. Landry, Univ. Col. Victoria, '90.

Oscar T. George, Baltimore College of Physicians and Surgeons, '95.

J. E. Galvin, Baltimore University, '95.

Joseph Taylor, Dartmouth, '93.

Harry G. Bullard, Dartmouth, '91.

Charles Edward Holton, U. V. M., '92.

The following physicians were elected to membership:

Geo. F. Adams, West Derby, U. V. M. '79.

J. F. Blanchard, Newport, U. V. M. '87.

R. H. Blanchard, St. Johnsbury, Bellevue '96.

Harry G. Bullard, St. Johnsbury, Dartmouth '91.

F. D. Badger, Coventry, U. V. M. '83.

A. A. Cheeney, Lyndonville, U. V. M. —.

H. S. Chaffee, Rochester, U. V. M. '96.

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O. O. Davis, Northfield, Dartmouth '64.
H. A. Elliot, Barnet, U. V. M. '93.
L. H. Gillett, Wilmington, U. V. M. '92.
C. R. Gibson, Woodsville, N. H., Bowdoin '75.
W. F. Gilman, Brownington, Univ. N. Y. '82.
L. H. Hemenway, Manchester, U. V. M. '66.
C. S. Hinman, W. Charleston, Darthmouth '74.
H. C. Ide, St. Johnsbury, Bellevue '96.
Samuel M. Jackson, Barre, U. V. M. '81.
J. E. LaRocque, Burlington, Dartmouth '82.
Edw. J. Melville, Bakersfield.
G. P. Morris, W. Randolph.
J. R. Nelson, St. Johnsbury, P. and S., N. Y., '69.
Frank C. Phelps, Vergennes, U. V. M. '93.
R. G. Prentiss, Johnson, U. V. M. '94.
A. W. Scott, Lunenburgh, U. V. M. '91.
Wm. T. Slayton, Hyde Park, Harvard '96.
Artemus Ward, Canaan, U. V. M., '81.
C. M. Terrill, White River Junction, reinstated.

The executive committee reported the following program for 1897.

Use of the obstetrical forceps, G. B. Bullard.
Some unusual surgical cases, E. F. Upham.
Higher medical education, Wm. T. Slayton.
Cancer of the uterus, J. B. Wheeler.

Papers (titles unannounced) by H. H. Lee, F. T. Kidder, J. A. Howard, W. E. Lazelle, E. S. Allbee, J. E. Hartshorne, C. E. Allen, E. A. Bates, A. B. Bisbee, J. N. Jenne and W. J. Aldrich.

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ATTENDANCE.

Lyman Rogers, Bennington.
J. A. Howard, Alburgh Spa.
H. D. Holton, Brattleboro.
H. S. Brown, St. Johnsbury.
J. M. Allen, St. Johnsbury.
W. J. Aldrich, St. Johnsbury.
H. C. Ide, St. Johnsbury,
J. E. Hartshorne, St. Johnsbury.
J. R. Nelson, St. Johnsbury.
G. B. Bullard, St. Johnsbury.
Harry G. Bullard, St. Johnsbury.
C. A. Cramton, St. Johnsbury.
E. H. Ross, St. Johnsbury.
Geo. H. Gorham, Bellows Falls.
E. S. Allbee, Bellows Falls.
J. Sutcliffe Hill, Bellows Falls.
J. H. Linsley, Burlington.
H. N. Jackson, Burlington.
J. B. Wheeler, Burlington.
J. M. Clarke, Burlington.
D. C. Hawley, Burlington.
Geo. Davenport, E. Randolph.
E. F. Upham, W. Randolph.
W. S. Nay, Underhill.
W. H. Vincent, Orwell.
F. T. Kidder, Woodstock.
Hall Staples, Grafton.
L. H. Hemenway, Manchester.
E. H. Martin, Middlebury.
H. H. Lee, Wells River.

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Artemus Ward, Canaan.
W. E. Lazelle, Plainfield.
Fred Fletcher, Bradford.
F. W. Comings, Derby.
A. J. Lance, Worcester.
F. L. Osgood, Townshend.
F. D. Badger, Coventry.
J. H. Jackson, Barre.
N. C. B. Haviland, Danville.
O. E. Carter, Danville.
Wm. T. Slayton, Hyde Park.
E. M. Brown, Sheldon.
J. N. Jenne, St. Albans.
W. D. Huntington, Rochester.
D. G. Kemp, Montpelier.
M. R. Crain, Rutland.
A. W. Scott, Lunenburg.
Geo. F. Adams, West Derby.
C. R. Gibson, Woodsville, N. H.
J. F. Blanchard, Newport.
H. A. Elliot, Barnet.
F. S. Gray, Troy.
C. S. Hinman, W. Charleston.
W. F. Gilman, Wilmington.
J. M. Hamilton, Proctor.
Geo. S. Foster, Putney.
C. M. Terrill, White River Junction.
T. F. Gartland, White River Junction.
S. E. Darling, Hardwick.
S. A. Jones, Sheffield.
A. B. Bisbee, Montpelier.
F. E. Leonard, Montpelier.

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E. D. Ferguson, Troy, N. Y.
Henry O. Marcy, Boston, Mass.
J. M. Gibson, McIndoes.
Wm. T. Smith, Hanover, N. H.
R. T. Thompson, Fitchburgh, Mass. (Delegate.)
Walter S. Munger, Watertown, Conn. (Delegate.)
E. O. Crossman, Lisbon, N. H.
G. W. McGregor, Littleton, N. H.

Total attendance, 70.

On motion, adjourned.

D. C. HAWLEY, Secretary.

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The Cure of Hernia.

Henry O. Marcy A. M., M. D., LL. D. Boston Mass.
Address before the Vermont Medical Society at St. Johnsbury, 1896. Illustrated with Stereopticon.

Among the many wonderful achievements in the art of surgery of the present generation, the easy and safe cure of hernia may well commend high (position) consideration. It is very probable that no one of the many problems, constantly pressed upon the attention of the surgeon, because of the multitude of sufferers from this affection, received more careful consideration and profound research by the great masters of the past generations. The special student is astonished at the enormous volume of the literature upon this subject. Over eighty of the closely printed quarto pages of the Index of our great National Medical Library are occupied by an abbreviated list of titles alone of authors who have written upon the subject of hernia. It is questionable if the physician of to-day is more familiar with the anatomy, both normal and pathological of hernia than was the student in a former generation. It is certainly true, notwithstanding the careful dissections made for, and often by each medical student before graduation, that we are obliged to refer to the masterly works of Camper, Cooper, Scarpa, Cloquet, Langenbeck, Bourgery and others of an earlier period for our most accurate and exhaustive illustrative teaching upon this subject.

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Indeed, in the earlier period operations undertaken for the cure of hernia were not infrequent and often were successful.

The key, however, was wanting to unlock the mystery which ever invested the surgical problems and which gave to the repair process of wounds the ever illusive complication of the so-called supervening inflammations.

The changes ensuing in incised wounds, made for the proper manipulation of the parts involved in hernia, were followed by such a high mortality that experience forbade their continuance, and a quarter of a century ago the methods undertaken for the cure of hernia were limited to pressure processes, injections, and the subcutaneous appliance of wire ligatures, and these in the hands of the most expert as a rule failed to cure.

Profiting by the demonstration that the so-called inflammatory processes supervening in wounds were due to bacterial infection and that science rendered it possible for the surgeon to make and maintain aseptic wounds, as the decided rule in practice, later it became possible to deal safely with the various structures which are so deformed as to cause a weakness in the retaining abdominal walls.

This accomplished the problem was simplified to the reconstruction of the parts after their normal pattern, and this pertains to every variety of hernia. However, in order to do this, one more factor in the surgical problem needed solving, and this appeared to me as plainly evident in 1870 as at the present. As I then thought, profiting from Mr. Listers' marvellous demonstrations and his personal instructions, that I had mastered the art of making and maintaining a wound aseptic, it seemed a logical deduction, if primary repair ensued after the constricting of an artery by an animal liga-

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ture, the same result would follow the coaptation of the tissues by animal sutures.

It is not my purpose this evening, however interesting and instructive the subject may be, to refer to the evolution of these processes which, little by little became applicable in the rejoining of all aseptic vitalized structures, and which are in daily practice in every surgical clinic.

It only suffices to say that certain precautionary measures are necessary, which must pertain to the closure of all wounds.

First,—That the strictures are aseptic.

Second,—That they are devitalized as little as possible.

Third,—That they are coaptated or rejoined by the use of aseptic absorbable sutures.

Fourth,—That these should be applied so as to hold at rest like structures with the minimum of constriction. This is essential in order that the vascularization of the parts included shall be diminished as little as possible.

Fifth,—The coaptated structures must lie in easy juxtaposition, so as to minimize the possible spaces for the formation of blood clots, and as little suture material is to be used as will accomplish this purpose, remembering that every superfluous stitch inflicts a damage to the structures which must be repaired and adds suture material which must be absorbed. Undue constrictions will frequently cause necrosis of aseptic tissues which contributes by so much to the possible overburdening of the vital processes.

The fatty tissues are the least well vitalized and not seldom break down and cause serious trouble even in aseptic wounds. This is especially true in the thick, fatty layers of the abdominal wall.

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Sixth.—The skin is to be closed by a fine animal suture applied through its deeper layer only so as to coaptate in even juxtaposition its edges, the suture itself remaining buried. When a wound is thus properly closed in layers, there is nothing to drain, its coaptation is perfect and no foreign material is subsequently to be removed from the parts involved. Hence drainage is not required, and the important end is thereby attained which renders it possible to cure the infracted surfaces by a germ proof seal.

This has its ideal accomplishment by covering to some extent each side of the wound with a layer of iodoform collodion reinforced by a few fibres of cotton. Thus treated, if the wound is *aseptic*, it will remain *aseptic* and *primary union* will supervene. In no part of the body is this more important than in the region of the groin, confessedly one of the most difficult to maintain aseptic under the still too common treatment with drainage and sterilized dressings.

In order to effect the cure of hernia in any part of the body, it is only necessary to become master of these principles and reduce them to accurate, active, working practice. The former is the *science*, the latter the *art* of surgery. Here we enter a most earnest plea for a thorough familiarity with the anatomy and a training in the practice of the art, best acquired under definite personal instruction of a master. The pressing want of to-day is apprenticeship, recognized in the trades, nowhere so important however, as in the art of surgery. Technique can never be obtained from books.

A brief analysis of the varieties of hernia will necessarily, when treated even in abstract, extend beyond the

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limit of the present occasion because of the vast extent of the subject.

The simplest form of hernia is perhaps the ventral variety, so commonly met with after laparotomy. Here the dissection must be sufficiently ample to permit the restoration of the sundered structures in co-ordination. If a considerable peritoneal pouch is found this may be freely resected, and the peritoneum evenly held in co-aptation by a line of double continuous tendon sutures. The linea alba must be found, refreshed, and rejoined in a similar way. The skin is closed and the wound sealed as already described. No abdominal belt or bandage is afterward advised.

In a large experience with several hundred of abdominal wounds thus closed, they have remained firm and hernia has occurred in less than one per cent. of the cases.

Inguinal hernia in the *female* requires no special description, since to this the same principles above mentioned pertain.

Umbilical hernia is more difficult. Here the intra-abdominal pressure is usually much greater, the abdominal wall fat, and the contents of the hernial sac are often adherent. Not seldom considerable portions of diseased omentum must be dissected and evenly sutured at its very base and excised. The abdominal wall can generally be separated laterally in order to increase greatly the coaptating surfaces and secure a more firm union of the strong, unyielding parietal structures.

Femoral hernia requires a careful dissection, guided by accurate anatomical knowledge. If the sac is large, it is sutured and resected. If small and easily reducible, it is good practice to let it alone. Strong structures are slight-

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ly refreshed and evenly coaptated by a double continued suture, closing the opening well in upon the femoral vein.

The second layer of sutures coaptates the thick fascia over the plexus of vessels. In whatever way the sutures are introduced, the sheath of the femoral vessels must be brought clearly into view and is best protected by the finger during the suturing. It is surprising to note how little discomfort follows this operation. The results are most satisfactory. So far as I have been able to learn, in not a single one of my entire series of cases of femoral hernia has recurrence taken place.

Inguinal Hernia in the Male.

Only in this variety of hernia, by far the most common and confessedly the most difficult of cure, is there much room left for difference of opinion. By general consensus the operative wound should be ample to permit of free inspection and easy manipulation of the parts involved. The hernial sac, if at all large, should be opened, its contents inspected and cared for, the sac dissected to its very base, sutured in its long axis and resected. The cord is to be lifted from its bed with a minimum of injury, when it will be noted that, in by far the majority of cases, the hernial opening has been caused primarily by an enlargement from above downward of the internal ring. The structures entering into its composition are relaxed and bulging, and the strong transversalis fascia which makes up the posterior border of the inguinal canal was of primary defective development. It is, indeed, very probable that the larger number of inguinal hernia that occur even late in life are owing to a defective congenital development. By some

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means the posterior border of the canal must be reconstructed and the canal itself restored to its normal obliquity.

This means not so much the transplantation of the cord to new relationships, conditions which have been doubtless recently greatly over-emphasized, as the deflection of the intra-abdominal pressure so as to bring it at or near to a right angle with the line of the cord, instead of on a line with it. Any method which will accomplish this and permit of primary union will result in the cure of the hernia. The anatomical factorage to be emphasized is the coaptation of the posterior border of Poupart's ligament to the posterior border of the conjoined tendon quite as high up as is necessary to reform carefully the internal inguinal ring.

These structures are coaptated about the cord at its exit from the abdominal cavity. It will be noted that the relaxed transversalis fascia is intrafolded, thereby re-enforcing the posterior border of the canal. The cord is now carefully replaced, and the external sundered structures are rejoined over it. I would emphasize the importance of this procedure, since by so doing a firm, strong envelope covers the cord, and the external ring is reformed entirely as in the normal construction of the parts. The advantage of this is apparent in that it protects the abdominal wall from the formation of a direct hernia at the site of the internal ring.

In this, and the character and method of entering consist the chief differences between the operation which I have so long advocated and the various modifications known as the Bassini, Halsted, Fowler and other methods.

The introduction of animal sutures aseptically buried in the tissues, for a great variety of purposes, especially

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for the closure of the peritoneum, and the reconstruction of the inguinal canal for the cure of hernia, I presented in a series of articles, published years previous to the operation of Bassini and other modern surgeons, and it would afford me much pleasure to have the same duly accredited to American surgery. My first contribution upon the subject was published in 1871.

Where all the strong operative structures, which go to make up the posterior border of the abdominal canal are sutured beneath the cord, the transplantation of it has been by a direct opening through the strong abdominal wall, and the new canal or bed of the cord is found entirely in the fatty subcutaneous tissues. Even when the nutrition of the testicle does not suffer by this violent transplantation, a new danger is added in the subsequent risk of a direct hernia, occurring through a small opening which must necessarily remain in the abdominal wall. This is ever in direct line of the intra-abdominal pressure and will be found liable to yield to it in the subsequent history of the patient. In evidence that this is not an hypothetical criticism is adduced the fact that within a year I have myself operated on four cases of recurrent direct hernia following operation by this method.

The plain corollary to the problem is that the surgeon should follow strictly the teachings of normal anatomy and reconstruct the structures as far as possible after the primal order of normal development. This occasion demands a brevity which permits the criticism of dogmatism. At the risk of emphaising it, I trust I may be permitted to state briefly that my experience extending over a quarter of a century seems ample to corroborate the statements herein made.

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In a series numbering nearly four hundred cases where the operation has been undertaken for cure, I have yet to see a case where the life of the patient seemed endangered, when the intestinal canal was not involved. I have operated at all ages, from two months to eighty-three years, involving perhaps every variety of hernia. So far as I have been able to trace results, more than ninety per cent. of the cases have remained permanently cured. As a rule the patient is permitted to leave the bed at the end of the third or fourth week, resuming light duties at the end of the sixth week. No supporting bandages of any character are advised.

Dr. Coley, of New York, writes me under recent date, that he has operated upon 350 cases with only one death, and but two or three relapses.

It is needless to emphasize the importance of modern aseptic technique, since upon this the safety depends as well as in large degree the results to be obtained.

Present experience, however, is ample to prove that the operation for the cure of hernia in the male, the most difficult of all the forms of hernia, because of the complication of the cord, is really not dangerous, or difficult, if the principles above mentioned and the anatomy of the parts are well mastered, and merits general adoption.

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Acute Peritonitis from a Medical Standpoint.

By W. H. Vincent, M. D., Orwell.

I will review with you today my experience with one of the most serious diseases we have to treat.

It is not necessary for me to go over the symptoms of peritonitis—you all know them.

I can now recall 23 cases of this disease and it has been my good fortune to see 21 recover without surgical interference.

These cases were of the most severe form, where life was despaired of for a time.

Peritonitis may be considered as either acute, infectious or chronic. All my cases have been of an acute form, caused either by the irritation of undigested food, traumatism or irritation and disease of the reproductive organs of the female.

In a threatening case of acute peritonitis the first thing to do is to remove the irritating cause.

If from undigested food, and I am called early, I empty the stomach, if it has not already been done.

I then give salts or castor oil by the mouth and an enema of one ounce of Epsom salts and glycerine to one-half pint of water.

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I control the pain with opiates—codeine by the mouth or hypodemically as preferred, repeated as needed.

After removing all undigested food and irritation from the intestinal tract as far as possible and the stomach remains sensitive as it usually does, I try first hot water as hot as it can be swallowed, repeating every time there is an effort to vomit.

This washes the stomach out, acts as a sedative to the mucous membrane, prevents retching and stimulates the circulation.

I have seen the worst cases of vomiting relieved by hot water alone.

I also give a tenth grain calomel triturate every hour, and counter irritate over the stomach with mustard, horse radish leaves or spice poultices, stop all food but egg albumen, and if I then fail, I apply a fly blister over the pit of the stomach and give champagne in cracked ice which rarely fails to give relief.

If cathartics work easily your case will be of short duration as a rule, but usually you fail to have them retained. If you fail in the commencement of the disease you must wait.

At the first indication of inflammation and distention I depend on my hypodermics for the pain and turpentine stupes for the distention and inflammation.

I prepare my stupes in the following manner:

Oil meal enough to fill two cheese-muslin bags, one-fourth inch thick, large enough to completely cover the abdomen.

I order these to be heated in a steamer over hot water and when hot, cover the surface that comes next the body with fresh lard and when ready to apply sprinkle on a tea-

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spoonful of turpentine, changing the poultices every 30 or 60 minutes as required to keep hot.

The lard prevents the turpentine from blistering.

I give these directions fully, for unless you have an experienced nurse they will do more harm with these applications than good.

To remove the gas below the obstruction I use the following enema, repeating as required.

30 drops spts. turpentine.

½ teaspoonful sodium chloride.

An ounce each of sulphate magnesia and glycerine dissolved in one pint of warm water,

and I will guarantee you will empty the intestines of gas below the obstruction within five minutes.

Gas cannot live with this injection any more than pus can with peroxide of hydrogen.

I sometimes remove the gas by inserting a rectal tube and sometimes get benefit from high injections through the rectal tube.

As soon as the stomach will retain anything I give sweet oil in ounce doses every 3 hours until the bowels move, and if retained you will be surprised at the soothing effect it has. It is a non-irritant, soothing and nourishing cathartic.

If you fail with the above treatment you may be sure you have a case for surgical interference.

I have reported 23 cases of peritonitis with 21 recoveries treated as above.

The first case that died was diagnosed as obstruction of the bowels—a boy 7 years old—who was delicate—had always had indigestion—was taken with severe pains

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in the stomach and bowels, and vomiting—after riding a horse-rake—started as a severe attack of indigestion.

For one week his condition improved under treatment; at the beginning of the second week inflammation developed with distention and there was evidence of complete obstruction accompanied with general peritonitis.

An operation was asked for and refused. The symptoms continued and the patient died from prostration at the beginning of the fourth week.

The autopsy revealed the small intestine tied in a complete knot, causing a strangulation and obstruction.

Medication was handicapped in this case by mechanical obstruction and only a surgical operation could have saved the boy.

The peculiarity of this case was the length of time the child lived in this condition. The intestine must have been strangulated over two weeks.

The second case was a lady thirty-five years of age, strong and healthy to all appearances up to time of sickness. Saw the case first on Jan. 10, 1896; was taken with vomiting, and severe pain in the bowels, which gradually developed into peritonitis. Patient claimed her husband struck her in the bowels.

Tenderness, mostly in right side, over McBurney's point.

Said she had been kicked in the bowels four years before, which caused considerable inflammation, but had not given her much trouble of late.

The case continued about the same until Jan. 25th, or for fifteen days, with all the symptoms of peritonitis.

Retained but little food except by rectal enemas.

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About this time a tumor was distinctly felt at McBurney's point, and appendicitis was suspected. A surgeon was called and my diagnosis confirmed.

We operated on Jan. 27th. The cœcum was found firmly bound down in region of appendix by old inflammatory adhesions, and very much thickened. The glands in this region were very much enlarged. The appendix showed the same inflammatory condition as the cœcum, but did not seem to be the primary cause of inflammation.

Six inches of the intestine was removed. It was a long, tedious operation owing to the strong adhesions, and the patient never fully recovered from the operation.

This brings us to a very important part of the subject.

There is no disease a physician comes in contact with that so taxes the skill and judgment to decide whether to depend upon medication or an operation.

The attending physician is the one to decide this question and it often comes to a point where immediate decision means life or death to your patient.

Appendicitis is given as one of the most common causes of peritonitis.

Not long ago I heard a physician say he believed every case of acute peritonitis caused by indigestion was appendicitis in a mild or severe form.

I did not agree with him.

There has been so much written upon appendicitis in newspapers and medical literature for the past few years that not only those with real appendicitis were operated on, but many in our large cities were worked up to a point of having the appendix removed for fear they might have it.

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Berries and fruit were unsalable at our summer resorts for a time for fear some of our city friends might get a seed lodged in the appendix, but as far as I know those who have operated find this to be of rare occurrence.

I have never thought appendicitis was a very common disease. I have never yet seen a typical case. I have practiced medicine twelve years in Orwell and I have never known of there being a case in town.

This is no sign the inhabitants of Orwell are exempt from this disease—I may see a case within a week. I only hope when I have a case I will be smart enough to know whether to depend upon medication or on operation.

Those of you who attended the State Society last year no doubt remember the excellent paper of Dr. S. C. Gordon, of Portland, Me., on the "Medical and Surgical Treatment of Appendicitis."

I was glad to hear him speak so favorably of the medical treatment of this disease, as I have always felt far too many have been subjected to the surgeon's knife, which is apt to be the case when a new operation presents itself. Dr. Gordon claimed he could cure 90 per cent of his cases by the alkaline treatment, and he had never failed when he saw his cases sufficiently early.

He never operated in the acute stage of the disease, but during the remission or commencement of the second attack.

The September issue of the *Medical Brief* contains the concluding article on the medical side of appendicitis by Dr. E. H. Richardson, of Atlanta, Ga., begun in July.

He is unwilling to be influenced by the sentiment now taught that appendicitis is invariably a surgical disease.

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He states that of 100 cases treated from the earliest manifestations of the disease by rest, abstinence from food, opium sufficient to control pain, emptying bowels by large enemas, and hot poultices to the abdomen, 90 cases will end in recovery without surgery.

Eminent French, English and American authors are cited to sustain this view.

The author advises the use of the knife only to give exit to pus where formed for perforation, and for the relapsing form in young subjects, and then only during the remission.

During an acute attack the author insists that surgical interference should never be resorted to except to relieve the above conditions, and rarely before the fifth day.

To operate during the acme of the inflammatory stage and only to remove the appendix he regards as not founded on sound surgical principles and with unwarranted risk to the patient, and in concluding expresses the belief that the future will demonstrate that the treatment of appendicitis belongs to the field of medicine and not to surgery.

Dr. Richardson's extended American experience and observations in the hospitals of London, Paris and Vienna should give weight to his views.

The paper of Dr. McArtney of May 2d, in the *New York Medical Record*, entitled, "Appendicitis from a Medical Standpoint," in which he has successfully treated 24 continuous cases by medicine alone, has been thoroughly discussed on both sides in the same journal.

This paper has been severely criticised by such men as Wyeth and Morris, who are authority in surgery.

They went so far as to say that he, McArtney, was probably at error in diagnosis, but found the discussion so

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hot on the medical side of the question that Dr. Morris finally admits that no doubt McArtney was correct in his diagnosis, and for physicians who are not in control of better resources, the opium treatment will do, and merits attention, but that medical treatment should be rarely substituted in the cities for surgical means.

I can see where the consulting surgeon who operates with a large percentage of recoveries may submit cases to an operation in private practice that might have recovered by medication; while on the other hand a physician who has had success by medication may wait too long before calling the surgeon, but we should lay aside prejudice and examine our cases early in an unbiassed, candid and thorough manner before opiates or general peritonitis have masked and covered up the symptoms, and as I have said before, no disease will try the skill of a physician more than this, to decide what plan of treatment will be the best and safest for his patient, and the physician who thinks medication will bring every case of appendicitis to a safe termination, or the surgeon who thinks that every case of appendicitis should be operated on, should be considered as professional cranks and unsafe to follow the profession to which they belong.

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The Mineral Springs of Vermont.

THEIR THERAPEUTIC EFFECT, ETC.

By E. M. Brown, M. D., Sheldon.

The paper which I wish to present to the Society this afternoon, and which is sohastily and imperfectly prepared that it should be prefaced with an apology, is for the purpose of calling your attention to that which should interest you, not only as physicians, interested in everything which has within itself the medicinal ingredients of restorative power, but also, as loyal citizens of the State of Vermont, interested in all of her many resources, which should become more widely known and developed as a source of pride and revenue to our Commonwealth.

And one of these resources is our Mineral Springs, which I think today are greatly neglected, and which if more perfectly developed and advertised are capable of returning to the participant a degree of health and strength from a great variety of chronic diseases, which makes money of little value in comparison. Born and reared as a majority of Vermonters are, in or near the town or county in which we live the greater part of our lives, the worth, beauty and attractions with which our noble State abounds are not so well appreciated as they would be

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were our State newer and its inhabitants newly settled emigrants seeking homes and wealth.

Where is there a State in the Union which during the summer months presents greater attractions to those in quest of health and pleasure than does the State of Vermont? From early June until late in September the pure, fragrant mountain air is loaded with oxygen from the growing forests, capable of vivifying the system and restoring the rosy blush of health to the pale and emaciated cheek of city life.

The interest which our State is taking through its legislators in passing laws for the better protection of game and fish and in the stocking of ponds and streams is worthy of commendation, and with the constant improvement of our railroad facilities, Vermont should become one of the most popular summer and health resorts. Having in mind these attractions, my subject today treats especially of balneotheraphy, or the properties and therapeutic effect of mineral waters, in their natural state, as they issue from the earth.

Prof. Hare very truly states "That although an immense literature has accumulated concerning this subject, the precision which modern medicine demands is still lacking."

This is in part accounted for by the combination of ingredients which are usually present in our mineral springs. These medicinal ingredients held either in the finest atomic subdivision by solution which nature is capable of perfecting, or by chemical union in the water, a small amount of such entering the alimentary canal, will be absorbed and produce their therapeutic effect. And such effect by a given remedy or class of remedies direct from

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nature's great laboratory is of all sources first to be desired, and if practical, should be taken direct from the spring.

A twin sister to balneotherapy is hydrotherapy, and no case should be given up as hopeless until it, in some form, has been tried.

Hippocrates devoted a book to the discussion of water as a remedy. Asclepiades of Prusa was an ardent advocate of the same remedy. Galen was another, also the physicians of Egypt in the 14th century, Floyer of England in the 16th century, and later Liemssen and Strumpell of Germany, with our American writers down to the present date, Flint, Hammond, Hare and others. And each one of us can testify of its worth in the relief and cure of disease. In fact, as physicians, were we deprived of it, as a remedy, we would be fettered in a great degree in our work.

If pure, potable waters will do so much, mineral waters will do the same and much more. Prof. Whittaus says, "Although a short defined classification of mineral waters is not possible, one which is useful, if not accurate, may be made, based upon the predominance of some constituent or constituents, which impart to the water a well defined therapeutic value."

A classification which has been generally adopted, is into five classes, namely, Acidulous Waters, Alkaline Waters, Chalybeate Waters, Saline Waters and Sulphurous Waters, and Prof. Hare adds to this, Purgative, Calcareous and Thermal Waters.

Most of the mineral Waters of Vermont are Alkaline, Calcareous and Sulphurous waters; although it is difficult in some instances to classify them.

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In my effort to become acquainted with the different springs of the State, I have addressed the proprietors of all that I know of, asking for an analysis. From most of them I have had satisfactory replies, and if there are mineral springs in the locality of any physician present, which I do not mention, I hope they will so state, and if possible give the analysis.

Prof. Hitchcock in "The Geology of Vermont, 1861, speaks of mineral springs in the towns of Clarendon, Highgate, Alburgh, Williamstown, Newbury and Brunswick as fast becoming the resorts of those in quest of health and pleasure during the warm weather of summer."

A majority of the springs of Vermont belong to the class of sulphurous waters. Typical of this as American waters, Hare gives, Alburgh springs of Grand Isle County, Highgate Springs of Franklin County, and Newbury Springs of Orange County.

The analysis of the Highgate Spring, as given by Prof. Thomas S. Hunt of Montreal, gives it a larger per cent of medicinal ingredients than any other spring of its class in the State.

By analysis in 1000 parts water,

Highgate Spring contains,		Alburgh Spring contains,
Chloride of sodium,	.402	.140
Sulphate of sodium,	.042	.024
Carbonate of soda,	.235	.230
Carbonate of lime,	.024	.036
Carbonate of magnesia,	.010	.022
	713	452

Traces of potash and boric acid in each.

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To this class, aside from the Newbury Springs, called the "Montebello Sulphur and Iron Springs," the analysis of which is similar to the above, with the addition of phosphate of iron in small quantities, may be added those of Chester, Brunswick, Shaftsbury, Warren, Randolph, Tunbridge, Hartland and Arlington.

These are all more or less charged with sulphuretted hydrogen, both in free solution and chemical union, upon which the therapeutic effect is largely dependent. They have a stimulating effect upon the glands of the intestines, and as good an authority as Stifft of Berlin, says: "That sulphuretted hydrogen has a specific exciting action upon the sensitive fibers of the pulmonary branches of the pneumo-gastric, and upon the respiratory, cardiac and vaso-motor centers." Its prolonged use gives rise to paralysis from over stimulation.

Their therapeutic action would be indicated in relieving cutaneous and scrofulous diseases, a torpid and congested condition of the liver and spleen, and chronic poisoning from metals.

The Alburgh Spring was known and had quite an established reputation as early as 1816, when Dr. Benjamin Chandler of St. Albans, writes of its being very efficacious in the cure of all forms of cutaneous and scrofulous diseases.

The Highgate Spring was discovered in or about the year 1820, and was used as a successful remedy for scrofula, skin diseases, rheumatism and liver complaints.

In the class called Calcareous, those containing a predominance of lime, may be mentioned the Clarendon Springs of Rutland County as typical. The analysis by

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Prof. A. A. Hager, of Boston, of one gallon, or 235 cubic inches of water, is found to contain,

Carbonic acid gas.....46.16 cubic inches.
Nitrogen..... 9.63 "
Carbonate of lime ..... 3.02 grains.
Muriate of lime,
Sulphate of soda,
Sulphate magnesia, } ..... 2.74 grains.

100 cubic inches of the gas which evolves from the water contains of

Carbonic acid gas..... .05 cubic inches.
Oxygen gas..... 1.50 "
Nitrogen gas.....98.45 "

As belonging to this class, may be mentioned the Williamstown Springs, the Queechey Springs of Hartford, and the Elgin Springs of Vergennes, the analyses of which are similar, with the exception that I am not aware that they contain the amount of free nitrogen gas, in solution, which the Clarendon Spring contains.

Dr. Hayes says: "The Clarendon water is a remarkable water, holding free nitrogen, in solution."

The therapeutic effect of the salts of lime, soda and magnesia would be indicated in rachitis, cystitis, chronic catarrhal troubles of the alimentary canal, gout and acid dyspepsia. The Clarendon Spring was discovered in 1776, and was doubtless one of the first in the State to receive attention as a mineral spring.

To the Alkaline Springs, in order, as mentioned by Prof. Hare, are Sheldon Springs of Franklin County, Middletown Springs of Rutland County, and Welden Spring of Franklin County.

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The analysis of the Missisquoi Spring of Sheldon, as given by R. A. Whittaus, Professor of chemistry in our University of Vermont, is as follows:

In a million parts:	
Total solids dried at 120°	224.8
Solids fixed at dull redness	185.4
Free carbonic acid	45.49
Sodium chloride	0.38
Calcium chloride	2.12
Magnesium chloride	0.60
Sodium sulphate	6.52
Calcium sulphate	12.09
Aluminium sulphate	2.70
Magnesium sulphate	5.51
Sodium phosphate	0.08
Sodium bicarbonate	19.16
Potassium bicarbonate	4.11
Calcium bicarbonate	126.62
Magnesium bicarbonate	72.19
Manganous bicarbonate	1.40
Ferrous bicarbonate	3.03
Silicic acid	15.25
Crenic and apocrenic acids	traces.
Titanic acid	traces.
Ammonia	0.08
Total	271.76
Less carbonic acid and water from bicarbonates	89.00
	182.76
Specific gravity	1000.48

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There are several other springs of similar analysis in the town.

The analysis of the Middletown Springs by Prof. Collier of the Department at Washington.

One imperial gallon contains,

Calcium sulphate	.144 gr.
Calcium carbonate	3.351 gr.
Magnesium carbonate	1.265 gr.
Iron carbonate	1.335 gr.
Manganese	1.176 gr.
Alumina	.084 gr.
Potassium chloride	1.304 gr.
Sodium chloride	.217 gr.
Sodium carbonate	3.218 gr.

The chief ingredients of these waters are the alkaline carbonates of soda, lime, magnesia and lithia.

Dr. Sidney Ringer says that "Large quantities of any alkaline water taken before meals increase the secretions of the gastric juice."

They neutralize the acid of the stomach, dissolve and wash away the accumulated mucus, also stimulating the respiration and heart's action.

The salts, assisted by the free carbonic acid gas and oxygen which the water contains, materially promote oxydation of the effete material of the tissues, rendering the urine alkaline, with an increase of the urates, and diminution of the uric acid.

In all the range of balneology, there is no class of water which admits of so large a scope of therapeutic usefulness to the physician, as does this class.

As anti-catarrhal they are of the highest order, acting not only upon the mucous membrane of the bladder and

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gastro-intestinal tract, but also the mouth, throat and nasal passages. They are indicated in all chronic constitutional diseases, requiring an alterative, thus including many of the cutaneous affections.

From a fidelity to my own town, and a personal knowledge of the Sheldon Mineral Springs, I would for a few moments, call special attention to them. The Missisquoi a spring, the analysis of which has been given, is one of the most important.

The spring formerly called Kimball Spring was discovered sometime in the twenties, but did not attain any degreee of distinction until about 1864 or 1865, when it became widely known and advertised as a cancer cure, and the reported sales of the water, in a single year, exceeded $150,000.

That there was too much claimed for its remedial value in this line, there is no doubt, and it redounded to the disadvantage of the spring. Neither can there be doubt that in many well authenticated cases of cancer, in their incipient stages, a cure was produced, and in many other cases, a stasis of progress and temporary marked improvement was present, where a permanent cure was not obtained.

There is to-day no known specific for the cure of cancer, but I do think that the Missisquoi Spring water taken persistently, in large quantities, offers better prospects of good results than any other known pharmaceutical preparation.

Dr. Fordyce Barker, in his observations on the malignant disease of the uterus, before the New York Academy of Medicine, and published by that institution, remarks :— "The Missisquoi Spring water has in some cases seemed to

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be of great benefit in arresting the progress of the disease. In a few instances, one of cancer of the breast, and four of uterine cancer, the apparent effect has been more striking than any results I have seen from any other agent."

Dr. Marion Sims says:—"I can fully endorse all that my friend Dr. Barker has said about the Missisquoi Spring water. I have prescribed it with benefit in a few cases of cancer; but I consider it a great remedy in all scrofulous diseases, and in syphilitic afflictions. In these diseases its true value has not yet been fully recognized by the profession. It is also an admirable remedy in affections of the digestive organs and in some diseases of the kidneys." Testimony from such authority as this cannot be questioned.

Many cases could be reported had I the time. But I have written enough to direct your attention and I presume tax your patience.

The subject to me has become a very interesting one, and its scope of usefulness far too large to be covered by this short paper, and I am convinced that it is a subject most worthy of attracting some part of our attention.

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Inebriety and its Treatment.

By W. S. Nay, M. D., Underhill.

Gentlemen :—I assure you that I approach this subject with a great deal of diffidence, as I am conscious of my inability to handle it in a manner which so important a matter deserves, and lest I fail to convey to you the same degree of interest and enthusiasm with which I am possessed.

Since my earliest experience in the practice of medicine, I have been surprised that the subject of inebriety has received so little attention from the general practitioner, and that discussions, and papers if any, pertaining to it have been so meagre when reported, if reported at all. Physicians seem to stand aloof and sneer at all efforts of every kind to combat this evil, which explains in some measure the imperfect literature respecting it in this country.

There is probably not a wider field for investigation than is opened up by the discussion of this subject, for no physician can deny its importance, or plead lack of interest. I confess that we have in too great a measure become indifferent to the imperative needs—yes, even demands of many who are known in the circle of every physician's acquaintance and practice—but could we have known, or

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even now be conscious as we should be of each victim's cry of despair, many less important matters, looking from a practical standpoint would be overshadowed. Bacilli and all micro-organisms would stand in the background in order to give place to a more practical understanding of this baneful disease.

While it is not my purpose or desire to deliver a temperance lecture in this connection, yet I am not unmindful of the fact that no word picture can be painted which can portray in any particular the terrible effects and the misery occasioned by the toxic action of alcohol. Its victims are found in all walks of life. The keenest intellects among the professions, as well as the laity, suffer the penalties of indulgence, and to our shame be it said, those of our own profession are too often the victims of unbridled appetites, and proper subjects for treatment.

We are indebted to a few specialists for an active interest in, and close study of inebriety but their investigations solve the problem only so far as patients with ample means are concerned, who can avail themselves of the salutary influences afforded by the asylum and its surroundings. The average inebriate is more often, from the very fact of his over-indulgence, poor, homeless, and often friendless. His condition, while pitiful, does not awaken in the physician that degree of sympathy which it demands, or which it would do if a safe treatment could be given or a favorable prognosis be assured.

While we should uphold and encourage the many reform movements, brought about through the moral influence of the clergy, church, and all temperance organizations, we cannot overlook the fact that statistics disprove their success. The assurance that faith, coupled with the

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refining influences of society, new found friends and fellowships, is for a time effectual, and awakens a desire and hope of reformation, but as a means of cure they are literally failures. The new becomes old, the associations commonplace, and the tendency of the disciple is to drift to old haunts—the diseased organism reasserts itself and he sinks lower than before in health and morals.

All legal restraint and punishment are only temporary, if imprisoned only during the period of incarceration. The subject having lost all pride and ambition drowns sorrow by renewed draughts and every impulse for good is surrendered to the baser impulses of his depraved nature.

It becomes, then the province of the physician to adminster relief, coupled with consolation, but the pertinent query is—how shall it be done?

In the rational treatment of patients it has always been acknowledged, and justly so, that the *modus operandi* must be adapted to each individual case. Heredity, temperament, manner of living, etc., are all considered in their respective relations to the disease in hand.

This applies with no less force to the treatment of drunkenness if the regular rational treatment is followed. The matter of abstaining from the usual daily allowance, or regulating that allowance is but one important factor. Proper exercise, diet, good influences, pleasures that divert from meditation, environment, etc., are all regulated with great exactness, coupled with such medication as is indicated in each individual case. All this is orthodox and commendable, but it does not follow that it is the only way because, perchance, it is recognized as regular and in accordance with stereotyped ideas.

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Physicians, as well as the clergy and laity, too often get into ruts, and we are too apt to fear criticism, if we venture independently into experimental practice, or possibly follow in the way, which some one more venturesome than others, has dared to tread before us.

I am not boastful of my own experience, nor do I claim originality of method.

I am not a disciple of Keeley of gold cure fame as I know nothing of *his* treatment so called, but unlike many leading medical periodicals, who disapprove of his methods, I censure nothing except its secrecy, nor should we censure any means by which some good can be accomplished. In fact I am indebted to the Medical Record of New York, and the New England Medical Monthly for hints which have served me well, though purporting to be an exposé of the Keeley method. Thus far, and no farther am I conversant with the so-called Keeley cure, and if I have been a faithful student of the medical journals, and have been successful by following hints derived therefrom, I am under no obligations not to reveal the course pursued in the treatment of my patients.

As a reward for persistent effort and perseverance I have been able to rescue seven from their downward course as a result of alcoholic indulgence, four of whom are now rejoicing in a complete release from an appetite which only liquor could satisfy. Perhaps I cannot do better than to take up each particular case in detail, previous to which, however, it may be well to indicate the manner of treatment. Physicians universally recognize one fact,—that the mental or moral effect as it is sometimes called, in the treatment of any patient, is always salutary, and in the patients who were under my care for inebriety its effect

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was no less noticeable than in other diseases. It often happens that what the patient expects will be done, it is often best to do, especially if a cure has been effected in some particular case with which he is conversant in which similar methods have been pursued.

The taking away from an alcoholic patient his accustomed stimulant, demands a substitute or his nervous system rebels. This substitute has been strychnia in all cases under my care, the action of which on heart, respiratory and vaso-motor centres is well known. It is wonderful, not only how much is borne, but how much seems to be demanded. One-fourth grain each day in divided doses has not produced any toxic effect, nor have I noticed any from accumulation. In the proportion seemingly, that strychnia is increased in the first few days of treatment, does the demand for the accustomed stimulant seem to decrease. Incidentally I may mention that other vegetable and mineral tonics are combined with the strychnia, which have served to stimulate nutrition and assimilation, besides the effect of combined action, which we usually recognize as beneficial.

The method of dosage has been, both by the stomach and hypodermically—the last of which is unnecessary, except for its mental effect, and as preliminary to a crisis which the patient is led to expect will come, and does come (when you desire it) by the timely substitution of 1-10 gr. of apomorphia.

Case 1st. A. W. E., American, aged 50, butcher; Has drunk intoxicating liquors from boyhood and in later years to excess. Began treatment by allowing patient to use all liquor desired, usually whiskey, of which one quart per day was used for three days, when the taste became

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somewhat unnatural and nauseating. He was encouraged, however to continue, at least his accustomed dram before meals, until at noon of fifth day, when the apparent usual hypodermic produced extreme nausea and vomiting, which patient attributed to the liquor which had become very distasteful.

Medication consisted of mixture as follows:

R,	Chl. Aurii et Sodii,	½dr.
	Strych. nitratis,	grs. iv.
	Atropiæ Sulph.,	gr. i.
	Glycerinæ,	2 ozs.
	Tr. Cinchon. Comp.	4 ozs.

M. Sig:— Dose: Teaspoonful before meals. Hypodermic, Nit. strychnia, 1-120 gr. three times daily. Dissolve slowly in the mouth once in four hours a tablet (made for me by John Wyeth & Bro.,) containing nitrate strychnia, 1-120 gr., atropia sulph., 1-150 gr., chl. gold and sodium 1-50 gr. Patient complained of no discomfort except dryness of throat and mouth from the atropia. Treatment continued four weeks with gradual diminution of tablets, but allowed to continue tonic for four weeks more. In this case the appetite increased, bowels more regular, and a sensation of bouyancy experienced. Patient continued his work and there was no appetite or desire for liquor after the first week. He pronounced himself cured, for which he was delighted, and expressed himself when bill was paid as experiencing more satisfaction in paying it than ever any before. He relapsed in six months. Cause—"couldn't have any fun."

Case 2d. G. L., American, laborer, aged about 50. Had determined to start for Montpelier, but decided to try

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luck at home, and save $40.00. Allowed to use all liquor desired, which some days amounted to three pints of whiskey, until fourth day. Was able to come after his stimulus, and came to the office for treatment but was exceedingly happy. After third day liquor became nauseating, used only one-half pint of whiskey to noon of fifth day, when he remarked that he thought he should be sick. We thought so too, and were not disappointed after the mid-day hypodermic. No liquor was drunk after the fifth day. Treatment same as in case 1. Has drunk none for two and one half years, and says he has not seen a moment when he craved it. This patient is prospering in business and says he has no desire for the old times.

Case 3d. H. McV., Irish farmer, aged 30, claimed he could not exist without a quart of spirits per day. His appearance indicated his habits, but he expressed a wish to take treatment on the "no cure no pay" plan. Medication same as in former cases. The first four days drank two gallons of whiskey and five gallons of hard cider. Liquor began to taste bad after fourth day. Gave apomorphia on the morning of fifth day. Gave him whiskey against his wishes on eighth day. Stomach did not retain it. Usual result after four weeks treatment. He has drunk none since, and says he has no appetite for it, often buys it for his mother who is an invalid, but claims it does not tempt him.

Case 4th. W. B., stage driver, French, aged 40. Because he got his whiskey in the trade, tried to make the most of it, and drank one quart per day for three days. Gradually dropped to one-half pint. Showed some symptoms of tremens during early days of treatment—saw people in the house and various objects. Symptoms disap-

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peared under use of bromides. Other treatment did not differ materially from other cases. Made good recovery. Could use neither rum nor tobacco for more than a year, when he drank to excess on one occasion to punish his wife for some imaginary misdemeanor. Said he did not want it, and as far as I can learn has drunk none since. Took promises for pay in this case, and have them yet.

Cases 5th and 6th are similar. Case 5th. F. T., American, clerk. Made a good recovery under treatment but relapsed within a year, because he could not defend himself against jeers of friends. Began drinking to please them, and not because he wanted it. Old appetite is now renewed and he suffers consequences.

Case 6th. H. W., American, wheelwright, aged 55. Claimed he was released from appetite for liquor for more than a year. Has removed from town but learn he is drinking again. Understand he claims to have been struck by lightning, and is evidently a believer in the "similia similibus curanter" doctrine.

Case 7th. F. P., aged 30, engaged in lumber business, American. Was nearly a complete wreck but determined to try the cure. Returned to his business in four weeks, and is free from any desire for stimulants after two years. In a recent conversation, he tells me there has never been any longing for liquor, although most aggravating temptations have been placed in his way.

These few cases and the flattering results assure me that we have at hand remedies which do cure the appetite for liquor, and are within the reach, and can be under the control, of every physician.

I have no doubt respecting the successful issue of every case which may come into your hands, but it re-

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quires a strong determination on the part of a patient to resist the social invitations which will assail him. Every man who has anxiety enough respecting the terrible appetite which has fastened itself upon him, to put himself under treatment, should be encouraged when he has put his hand to the plow, never to look back.

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Some Observations on Preventive Medicine.

By J. Henry Jackson, M. D., Barre.

Mr. President, and Fellows of Vermont State Medical Society:

In response to the order of the executive committee, I present a few observations on State medicine and kindred topics which may be suggestive and helpful to others.

And first I would offer a personal expression of satisfaction to our State Board of Health for the timely circular recently issued by them on tuberculosis. I wish a copy of it might be placed in every home in our land, that by the careful isolation therein taught we may have the fewest possible fatalities from this terrible scourge which destroys annually in the United States one hundred and seventy thousand, and causes one-seventh of all the deaths in the world.

In this connection there arises the question of milk purity. As the years go by there is an increasing tendency to feed infants artificially and to deprive them of that best boon of early life—the maternal fountain. While compensation for this loss can never be fully made, we are under obligation to furnish the future men and women of our country with the best substitute that can be obtained. The discussions and object lessons heretofore presented to this society upon the subject of tuberculosis in cattle should not di-

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minish until all the dairies in the State shall be subject to inspection, and examination of the herds by some duly authorized person with the aid of the tuberculin test, and the granting of a license to such owners as are found to possess healthy cows. I believe our farmers and dairymen will be willing to comply with legal enactments if our legislature will make known the necessity.

It has recently come to my knowledge that an epidemic of typhoid fever is prevailing in a settlement in central Vermont whose inhabitants are largely of foreign birth. Many of the houses are built in a cheap manner, for rent, and almost no attention is given to drainage or to the supply of pure water. In some cases there are found two excavations belonging to each house; one small and shallow for the reception of sewage, and not many feet away a larger and deeper one for the collecting of water for drinking and culinary purposes. It is more than probable that the filth diseases do so originate and are thus continued; and only the early correction of this careless and unsanitary method of living will prevent similar serious results elsewhere.

A few years ago one of our most prosperous villages was in a like unsanitary condition, and typhoid fever, diphtheria and other diseases of that kind gave a rich harvest to the physicians and undertakers, but brought sorrow and blight to many homes. After many town meetings, much argument and faithful house-to-house visitation, the taxpayers became willing to have a change. An excellent supply of pure water was furnished and a complete system of sewerage put in, and during the several years that have followed there have been but few cases of filth disease and no epidemics in that locality.

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In New England there has been a long established custom of general house-cleaning in the spring and autumn, when, according to the funny column of the newspaper, the house is in such confusion that the inmates must depend for nourishment upon lunches eaten in the pantry until order is again restored and the house is once more clean. I would like to inquire what proportion of the houses so cleaned have had the same care bestowed upon the attic and cellar as upon the general living rooms, and have had the useless and microbe-producing substances removed and destroyed. How much the politicians would enjoy the bonfires which could be fed this fall from our attics, and how much the attics would be relieved by having their stores of clothes, hats, broken furniture and other rubbish fed to the flames. When this has been done, and the cellars have sent out their disease-laden refuse, and the ceilings and walls have received a generous supply of easily obtained white-wash and pure air, the house may be pronounced clean. The school-houses must not be forgotten in the annual cleaning, and the preventable diseases of children may be reduced to a minimum by frequent fumigations and whitewashing. Even the churches will do well to follow this commendable fashion and preserve that cleanliness, which in all well-regulated communities is ranked next to godliness.

Some observer of athletic sports has recently made the statement that athletes are not a long-lived class and that a large percentage of them become disabled or die at an early age of tuberculosis. As a rule the bicycle record-breaker or the base ball victor of one year is not the successful racer or pitcher of the next, and the chances are that he will not be strong enough to profitably compete in

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any of the manly sports. The only permanent reminder of his days as a scorcher will be the hump which he will always carry, or the deformed finger-joints, lame heart, or deformed nose. "'T is true 't is pity and pity 't is 't is true'' that men show so little common sense in the use of the bicycle, when with a proper saddle to prevent urethritis and the erect position as in horse-back riding, to secure good respiration, it might, if used with moderation, be one of the most healthful as well as most convenient methods of transportation or recreation.

Preventive Medicine is to-day the great search-light of our profession, sending its rays into the dark places of the earth and giving notice to its inhabitants of impending danger. Theories are developing into facts, prophecies are being fulfilled, and the Roentgen rays of the laboratory are finding the causes of diseases as our fathers in medicine could not discover them. Healthy people are not predisposed to disease from any source. The various forms of bacilli may invade the healthy organism and not find a resting place. Or should they obtain a temporary lodgment they may be met and expelled as rude invaders by those faithful sentinels of nature—the leucocytes or white blood corpuscles. If, however, the system shall become depleted from any cause, then colonies of bacilli may take up their permanent abode in different portions of the body, more especially the lungs, as in tuberculosis, and carry on their work of destruction.

The people of this country are thinking and speaking about these things, and are ready to learn new truths. Consequently public opinion is progressing. State Medicine meets the public with new facts, gives proof of the danger, and shows a way of prevention. Our State Socie-

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ty is willing to assume its share of responsibility in furthering public education. Each member of the society should be a committee of one to provide the greatest good for the greatest number by his own personal teaching, by rendering aid to the health officers of the town in which he lives, and by impressing on one member of the legislature the importance of correct state laws.

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A Class of Fatal Cases Presumably Due to Intestinal Ptomains.

By E. D. Ferguson, M. D., Troy, N. Y.

Something of over twenty years ago a case occurred under my observation that created in me a profound interest and became the subject of considerable thought and reading. The patient, a man about forty years of age, had the appearance and history of robust health. I had known him for several years and his sturdy figure had impressed me with a favorable view as to his ability to resist disease and his chance for many years of life. He was taken quite suddenly with abdominal pain and became rapidly very ill, so that on the second day I saw him in consultation. From the condition and clinical history, we could fairly exclude intestinal obstruction and peritonitis, but vomiting, which had begun early in the trouble, had continued, and instead of becoming offensive in odor, as would have been expected in obstruction, was of a watery material which later showed small brownish flakes which gradually grew darker. The vomiting was frequent but not violent, and at times was rather a regurgitation than a vomiting. His pulse was rapid, the countenance anxious, the complexion somewhat "muddy," although he had naturally a dark skin, and the sclerotic lost its pearly clear-

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ness, although not to a degree to lead me to pronounce it colored with bile. The movement of the bowels did not throw much light upon the case, but the color, though dark, was not a healthy brown, neither was it a green nor a black. There was quite a degree of tympanites, but no notable tenderness.

The man was evidently "sick unto death," though he retained his mental faculties in a fair state during the greater part of his illness. The vomited material grew darker, finally almost a "black vomit;" his pulse became very rapid, and just before death the temperature rose to a very high point—over 105° F. No post-mortem examination was made, nor do I now think that any positive result could have been obtained from one, in view of the limited knowledge of pathology then in our possession.

Here was a case that I was unable to classify. That it was not a common disease was evident; nor could I assign it to any of the recognized forms of fever or local inflammations. That it was toxic in its origin seemed the only rational explanation, but none of the mineral or alkaloidal poisons would furnish a similar clinical history. The animal poisons seemed the more probable basis of explanation, and I recall my disappointment, when some few years thereafter, I read Boehm's article on sausage, fish, and cheese poisoning, in Ziemssen's "Cyclopædia," without securing definite aid in unravelling the tangle. I had awaited the appearance of that volume with this case in mind, and though disappointed in the hope of definite aid, my opinion that I had seen the work of some animal poison was strengthened in a general way.

However, I had been unable to secure evidence that the patient had taken any food likely to cause the trouble,

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or different from that taken by other members of the family. Hence I finally evolved the idea that this was a case of auto-infection, though the conclusion was based upon a process of exclusion rather than any reliable evidence from pathological investigations.

About ten years thereafter I witnessed a similar course of events in a girl about ten or twelve years of age. The onset was sudden, there being considerable abdominal pain, fever, and vomiting, with rapid failure in the vital forces. The vomiting was possibly more regurgitative in character than that of the first case, but the colored and finally "coffee-ground" appearance of the material from the stomach recalled the former case and led me to anticipate the fatal issue, which occurred in slightly less than three days from the time of onset. By this time some progress had been made in the chemistry of decomposition. Alkaloids had been secured from animal tissues, and a presumption was beginning to take reasonable grounds in favor of the intervention of bacteria in the process. The work of Selmi, of Bologna; Gautier, of Paris; and Brieger, of Berlin, had begun to throw a degree of valuable light upon this somewhat obscure field, so that rather definite notions were possible, and I began to speculate somewhat on the various links in the chain represented by my two cases. The dark or coffee-ground vomit had impressed me as an important element in the evidence, for I felt that I could exclude upon reasonably good grounds the presence of gastric ulcer in any of its forms as the source of the hæmatemesis. In piecing together the more prominent signs and symptoms as I have related them, I came to the conclusion that the first step was due to the presence and functional activity of some micro-organism in the intestinal

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canal; that thence resulted some ptomain or toxin which was absorbed into the intestinal veins and reached the liver, where it induced a rapidly progressive and diffuse parenchymatous hepatitis with its attendant systemic and local phenonomena, among which was the hæmatemesis. To a certain extent, the process seemed analogous to acute yellow atrophy of the liver, or even yellow fever, though the cases did not show notable icterus. The analogy was sufficient, however, to induce the opinion that when another case occurred an autopsy would show profound hepatic changes.

Not very long after the second case I was requested to see a child about four years of age, which was thought to be suffering from peritonitis, with a view to opening the abdomen in the hope of finding the cause and removing the same. Though the child's abdomen was somewhat tympanitic, the evidence of peritonitis did not seem clear enough to warrant a surgical procedure, and the fact that regurgitation of a watery mucus with small brownish flakes had recently occurred, together with the rapid development of the symptoms, led me to conclude that the case was similar to those just related, and that "black vomit" would occur and death follow. Such proved to be the case, the patient perishing after about three days of illness. The autopsy showed no peritonitis. The bowels were distended with gas, were quite hyperæmic, and contained a rather dark and somewhat grumous material. The liver had undergone notable changes; a portion being somewhat swollen, rather nutmeg-like, with brown and yellow mottling on section and softened in consistence, while the remainder was shrunken, the capsule was wrinkled, rather

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yellow in color, and was flexible with a rather leathery feel while handling without breaking the capsule.

A year or so after this case I saw a man, about forty-five years of age, who was also supposed to be suffering from peritonitis. The history showed abdominal pain, not localized, though apparently intestinal; very moderate distention with gas; rapid development of symptoms of exhaustion; rising fever; vomiting of a glairy, rather watery fluid; and slight icteroid tinge of the sclera. I ventured the opinion that the patient would have "black vomit" and would perish within a short time, which proved to be the case, for he died on the following day. A post-mortem examination showed the same condition of the abdominal organs that was found in the case of the child, the remaining organs of the body showing no evidence of disease.

So far I had encountered only cases of spontaneous origin, though they were not the only ones I had seen in which I had believed the same or a similar morbid process existed, yet they presented a more pronounced and typical course.

I now turn to a series of cases having a relationship that rendered them of even greater importance, for from them it seems reasonable that some practical conclusions may be deduced.

One evening three or four years ago, I was requested to see a young man who had just been shot in the abdomen. The bullet was believed to have penetrated the abdominal cavity. There was sufficient shock to justify a presumption that visceral injury had occurred. The usual preparations were made, and as early in the following day as the light would allow the abdomen was opened and a wound

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of the intestinal canal was found and closed. The patient progressed without serious symptoms for about two days, when he began to have abdominal pain and regurgitation of a watery material, which finally began to show brown specks but was not offensive. I felt that we were dealing with another case of poisoning by intestinal ptomains, and that a fatal issue would soon supervene. This proved to be the case, and the autopsy showed an absence of peritonitis aside from the adhesive peritonitis that was connected with the Lambert stitches and which had progressed only to the conservative degree that had resulted in the efficient closure of the wound in the bowel. The liver had undergone changes similar to those described in the foregoing cases, and there was no obstruction of the bowels.

In the spring of 1895, I operated for the purpose of suspending a retroverted and retroflexed uterus in a patient about thirty years of age. She had been under my care for about ten years, and persistent efforts by the use of pessaries had failed to restore and support the womb. She was in perfect physical health, and, measured by our present views of abdominal surgery, the risk was as near to zero as could be expected. The operation was simple and brief—a short incision gave ready access to the parts, and the uterus was brought into a forward position and fastened there. No severe shock was manifest, and the patient for twelve hours gave no evidence of any trouble. On the morning following the operation she was comfortable, but had regurgitated a small amount of watery material. This fact made me anxious, particularly as she showed some fever not accounted for by evidence of trouble in the operative field. On seeing her again in the evening, the

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regurgitation had increased and, though no brown color was yet present in the vomited material, her evident tendency, as shown by quickened pulse, rising temperature, and muddy complexion, was to enter upon the course of the other cases I have related. On the following day the vomit became dark, nearly black, and she died a little over fifty hours after the operation.

Not long after this case I operated for the removal of a large uterine myoma in a woman about fifty years or age. The patient was in fair general health, probably better than the majority of such patients, and the removal of the uterus was unattended by unusual difficulties or any accident. The magnitude of the operation, however, resulted in considerable shock, but the reaction was satisfactory. For the first eighteen hours all went well, when regurgitation began, and the now somewhat familiar picture was reproduced, she dying about forty-six hours after the operation.

Again, in February of this year, I operated on a woman about thirty-five years of age and in good physical condition, removing both ovaries, which were cystic and presented papillomatous growths. The cysts were each about the size of my two fists and were firmly bound in the pelvis. The operation was difficult but no accident occurred, and the shock, which was moderate, soon passed off. For the first twenty-four hours all went as satisfactorily as could be wished. She was comfortable and cheerful and the bowels responded satisfactorily and thoroughly to the saline cathartic given on the morning following the operation. During that afternoon, however, the regurgitation began, but without notable abdominal pain and no distention. The bowels continued to move until death, the discharge becoming dark colored toward the end. The vomit

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finally became black, and she died about sixty hours after the operation.

Here are eight cases presenting a sufficient number of signs and symptoms in common to indicate a similar origin and to justify placing them in a class by themselves. The conditions common to all the cases were: a sudden onset and rapid course of the trouble; the reference of subjective symptoms to the abdomen, such as pain and nausea; the presence of fever in each instance, the fever usually becoming very high just before death; the occurrence of coffee-ground, or black, vomit as the cases progressed; the absence of the usual signs of peritonitis; the absence of evidence of intestinal obstruction; the dusky or muddy hue of the countenance some hours before death, with possibly moderate yellowness of the sclerotic; and finally, the evidence furnished by the three autopsies made in the series of eight cases as related. Only one explanation has seemed to me tenable, and that was the presence and activity in the intestinal canal of some organism capable of producing a toxin which could not only give rise to pain in the bowels, but was capable of profoundly disturbing the function of the liver so as to induce a parenchymatous hepatitis with rapid softening and absorption, resulting in an acute atrophy. Of course this process may have been located in the liver more particularly than in the bowels, but that point did not allow of determination by any means at my hands.

There were four medical and four surgical cases in the series, and the clinical history removed them from the category of any ordinary infective process. Neither could we invoke the idea of some special micro-organism of a contagious nature, for the cases were isolated and not associated

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with similar cases either by time or locality, nor were they subject to unusual conditions or causes of disease, either in food, domicile, or other element of environment. The fact now recognized that the products of bacterial life are varied by certain conditions, in some instances a pathological micro-organism failing to give virulent products, while a change of conditions will result in a full establishment of its malign properties, seems to me pregnant with significance in many ways. It must be accepted that bacteria exist in the intestinal canal in all persons, and under certain yet unknown conditions some of them may become capable of inducing disease, though usually the tendency is harmless. The bacillus coli communis is a familiar example. The only logical explanation of this fact lies in the assumption that usually the functions are so discharged that the enemy is either inhibited from pernicious activity, or the special material upon which it depends for action is not at hand. In a general way, this may be represented by the terms immunity, resistance to disease, and the like; nor are these idle terms. They represent ideas that should command our attention with a view to practical deductions. It is not probable in the light of our present knowledge of pathology that these eight patients at remote intervals and places received into their bodies any micro-organism or toxin from which all other persons in the vicinity were exempt. It is more logical to suppose that they had become specially susceptible to the influence or activity of something present in the persons of others as well as of themselves, where, however, it either was not functionally active, or its products were neutralized. In the surgical cases it requires but little strain on the medical imagination to conceive that the shock attendant on opening the abdomen could have a notable

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influence on the chemistry of the intestinal canal. The subject has lately received considerable attention from other standpoints, and we are quite familiar with such terms as "stercoral empoisonment," "intestinal ptomains," etc. We can conceive of no other explanation, particularly of the fever, for all now accept that fever is usually the result of the presence of some toxin, whether the toxin results from the bacillus of diphtheria or typhoid fever on the one hand, or from the staphylococcus present in a furuncle. Just what constitutes the essential condition of vulnerability and reaction in each case, why some are made ill and others escape, is the problem that offers itself. Myriads of typhoid bacilli are swallowed without pathological results. Most of us have received the diphtheria germs in our bodies. Staphylococci are constantly gaining access to the crypts of the skin in each one of us without producing suppuration.

In many instances we can gather a clew to some of the conditions favoring infection. No extraordinary care is required to prevent local infection at pressure points in patients confined to bed with a fever, but when paraplegia exists all our best-directed efforts will probably fail to prevent a bedsore. In this instance a profound interference with innervation has evidently contributed to the creation of a local susceptibility to certain pathogenic germs. A review of the question of immunity has impressed me with the varied conditions under which it may exist, and the important fact that it may be lost.

In our surgical experience it is notorious that whatever diminishes the condition known as vital force—a term we can hardly dispense with as yet—increases the susceptibility to pathogenic organisms. Diabetics, drunkards, in fact all those who are below par by their own fault, or through dis-

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eases, do not present the same chance for successful surgical work as do those in good condition. A few pus-producing germs will usually fail to incite suppuration if in contact with healthy tissue, but even if in a healthy person they be present on or in tissue locally disturbed, as in tissue tightly ligatured, we can safely count on infection. We know, too, that a contagious disease will fail to infect some members of a family while others are attacked, and yet those who escape may contract the disease at a later exposure, and this without any physical change or deterioration in general health that we can note. The immunity of the negro to yellow fever is a fact for which we have no adequate explanation, any more than for our inability to engraft syphilis on the lower animals; but all these facts have a lesson which we should note and utilize so far as we can. In interpreting the phenomena connected with the cases I have related, it seemed fair to conclude that the result in the surgical cases was not due to the introduction of infection at the time of operation. This conclusion was justified by the absence of pathological changes in the operative field, together with the fact that the clinical history corresponded with those cases in which no operation was performed. If this conclusion is justifiable it adds another reason to show us that at present, much as has been done to diminish the hazard of severe surgical procedures, there remain some conditions involving risk to life which are as yet beyond our control, and which should prevent us from assuming that even an exploratory opening of the abdomen is free from risk. Previous to the case of suspension of the uterus, I had surgically entered the abdomen in a series of over twenty-five successive instances without a fatal result, and this simpler and apparently safer case than any in that list succumbed.

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In explanation of the process, as before indicated, it seems reasonable to me to invoke the aid of shock under the influence of which germs within the intestinal canal were able to produce toxins, which under ordinary conditions would not have been the case. So far as the preparation of the patients was concerned by examination in reference to the bodily functions, including the kidneys, etc., by the use of salines to "clean" the intestines, and by a proper diet in each instance, all that reasonable requirements could demand was done. It is not to be forgotten also that the usual history in these cases was previous good health, in some instances specially so. The speediness with which the condition developed and progressed to a fatal issue is also one of the important facts.

In discussing these cases with some of my medical friends, I learn that similar cases have occurred under their observation, but, while I find that most surgeons are inclined to credit them to acute "stercoral poisoning," they usually have ascribed the origin of the trouble to obstruction of the bowels, either by adhesions or the paralysis connected with peritonitis. In my cases, the evidence so far as it is available is opposed to such a conclusion ; nor does the clinical history correspond with that of intestinal obstruction. In some of my cases the bowels were moved, and, in the last one, the passages continued free to the end. That there should be a paretic condition of the bowels in a portion of the cases is not remarkable.

In a series of cases presented by Dr. H. O. Marcy at the recent meeting of the American Medical Association, and printed in the *Journal of the American Medical Association* for August 8, 1896, I find that he has assigned intestinal obstruction as the cause of the trouble in all his cases.

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In some of them it is clear that such was the explanation, but in others it is not so clear. The following is one of the cases.

"Mrs. D——, aged forty-two years. Very nervous organization, but in fair general vigor, although for some years a sufferer from a retroverted, adherent, enlarged uterus, cystic ovaries, and diseased tubes. The bowel had been freely evacuated; only fluid food in small quantities, often repeated, given for some days before the operation, with as large quantities of water as could be easily taken. Operation, March 18, 1896. It was difficult, owing to the imbedding of the diseased adnexa in the pelvic cavity. After the removal of the diseased structures, the enlarged retroverted uterus was brought forward and sutured upon each side to the abdominal wall. The pelvic peritoneum was reformed by lines of buried tendon sutures, leaving only a small portion of the fundus of the uterus uncovered, which was partially denuded of its peritoneum owing to old adhesions. The small intestines were covered by the omentum with great care, the fundus of the uterus was dusted with sterilized aristol, and a vaginal drain of iodoform gauze carried through the posterior cul-de-sac into the vagina. Patient rallied well from the ether. The night following the operation was comfortable. Nausea and vomiting ensued on the morning of the 19th, with a singular weakening of the heart's action, followed by a rapid elevation of temperature, reaching before death 107° F. The skin was mottled with dusty patches some hours prior to death. These conditions were believed to be due to intestinal obstruction. The guaze drain was withdrawn and an effort made to examine the pelvis through the opening, but without avail. Regardless of every effort, the

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patient died about forty hours after the operation. The autopsy showed a loop of the lower part of the small intestine attached to the fundus of the uterus, which was separated with the greatest ease. The intestine above was filled with several pints of a very fetid dark-colored fluid, believed to have undergone decomposition prior to death."

It is manifest that this case does not correspond to the usual history of intestinal obstruction, nor does the recent adhesion "which was separated with the greatest ease" amount to an obstruction, for it is certainly common to have temporary adhesion of the bowels after abdominal section and in cases of peritonitis, without serious trouble. The course and termination of the case, and the presence in the bowel of "several pints of a very fetid dark-colored fluid," speak strongly for the existence of some condition which was more important than even the possible obstruction, which we may probably assume was not occlusion. In our classification of cases it is important to seize upon some essential element for the assistance to be derived therefrom in our consideration of the clinical histories, and this is accomplished in placing to the front the idea of intestinal ptomains. I do not deny that intestinal obstruction may be present in addition. What I do wish to call attention to is that obstruction of the bowels without concomitant changes in the intestinal contents is usually a quiet, chronic condition, a fatal issue occurring at times only after many weeks. No doubt the obstruction is occasionally so prominent and important a factor as properly to entitle it to become the designating feature, but in many of the cases it is a minor element, and in still others does not exist.

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It would give me pleasure to present a full *exposé* of the life history of the micro-organism to which the process is due, but no light has been thrown on that part of our subject.

In conclusion I must place my title in error by relating a case that recovered, and I do so with some hesitation, for the account is so remarkable that it still seems to me like a "traveller's tale." Nearly two years ago I was requested by telephone to go to a neighboring town prepared to operate for obstruction of the bowels. I learned over the telephone that the patient had given birth to a child about two days before, that she had failed to have movements of the bowels, was somewhat tympanitic, was vomiting a dark fluid, had fever and abdominal pain, and was very much prostrated.

As it would be some time before I could reach the place, and as cathartics had been tried in vain, it was agreed that awaiting my arival copious enemas of water should be given. The treatment was diligently pursued. A large bag of water was emptied into the colon, and as it did not return, was followed by another—in fact by several others. In the meantime, the vomiting had increased in quantity and in frequency, and finally became fæcal in odor, which was at first regarded as confirmatory of the diagnosis of obstruction.

On my arrival I found fæces in fairly good-sized pieces in the recently vomited material, while some of that vomited at an earlier date was odorless, but contained sediment nearly as dark as charcoal dust. The patient was in a very weak condition, but she had begun to perspire moderately and her pulse was slightly less frequent, and the fever had fallen. Though I believed she would die, the idea occurred that possibly the poison could be removed in this unusual man-

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ner, and the washing was continued until the vomited material was quite clear. In order to maintain the action of the heart, strychnine was given hypodermatically in heroic doses, being guided by the pulse. She hovered between life and death for several days, then rallied somewhat, but developed a broncho-pneumonia and its attendant pleuritis, which placed her in great peril again. She finally recovered, and I believe has remained well. It is manifest that this treatment cannot be applied as a rule, but the lesson it carries is patent.

The arguments that have been made to explain the condition by the presence of a special microbe seem to me to lack sufficient fulness to entitle them to stand as final. Various organisms have been found in the intestinal canal—in cases of "stercoral empoisonment," even the pus-producing staphylococci—particularly in puerperal cases in which the pelvic organs were free from pathological changes. The problems are too recent and too complex to allow of definite conclusions on that phase of the question. In view of what is known of the behavior of micro-organisms under varying conditions, it is not improbable that we may finally arrive at two conclusions. First, the condition may be due to a special ferment, either a bacterium or an enzyme, and this may be present in the body without pernicious influence until a favorable combination of circumstances arises. This is favored by what is known of such organisms as the bacillus tuberculosis, the pneumococcus, etc. Second, it seems quite probable that the process may not depend upon one special organism, but circumstances may render one of several the offending agent.

This last supposition would involve the idea that the trouble is not dependent upon a constant cause, and, as a corollary, it would follow that the intermediate steps may be

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the same, or in other words, that we now class together several distinct processes on account of certain striking features in common. Such a conclusion seems to me probable, for the variation in the signs and symptoms of the cases noted, as well as in others I have not reported, seems to me to justify the assumption that similar but not identical processes were to be expected in the final explanation. However, the personal element of the equation may prove more important than is suspected.

There is still another hypothesis that is not entirely untenable. It is manifest that the chemistry of the digestive process is to a positive degree under the influence of the nervous apparatus, not only as to the rate of the process, but quite probably as to various details of it. Hence it is entirely possible that, given the usual elements of material and mechanism, if the nervous influence is sufficiently disturbed, products may result that could prove highly deleterious. The disturbance in digestion that occasionally comes to most people when under depressing emotions is a matter of common observation, and the limit of that disturbance has not been defined.

Concerning the measures which we may rationally take to protect our surgical cases from this danger, it is manifest that whatever will place the intestinal canal in a state of relative freedom from vitiated food products and micro-organisms would be reasonable measures to adopt. This can probably be best accomplished by a diet of plain articles of food, as milk, fish, etc., for three or four days before the operation, with the use of one or more doses of calomel, to be followed by Epsom salts on the day before the operation. It is quite possible that calomel has a special

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usefulness for this purpose. The free use of water also, to aid in the elimination, particularly through the kidneys, is important.

Still, do what we may, it is to be feared that for some time to come we will occasionally encounter one of these sad cases, and, as we advance in a series of successful operations, we should not flatter ourselves that we have mastered all the perils attendant upon surgery, or that the day of "capital operations" has passed.

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Address in Surgery.

DISEASES OF THE RECTUM.

By D. C. Hawley, A. B., M. D., Burlington, Vt.

I have selected the subject of diseases of the rectum, for the address in surgery at this time, for the reason that it has never been the topic of a paper and discussion in this society, and because it is one in which I am especially interested, and which I very much desire to see elevated from a position of odium, to its proper place in the estimation of the profession.

There has been a feeling which was ever too far reaching, that diseases of the rectum belonged properly to the domain of the charlatan, and regular practitioners have failed to give proper study to this class of diseases, have shrunk from the reputation of giving special attention to diseases of the rectum.

By the rank and file of the profession, work in this department has been carelessly and unskillfully done. Too many of us have been diagnosing every rectal ailment as piles, without an examination, and prescribing a salve therefor, which in nineteen out of every twenty cases has been useless, to the disgust of the patient and our own discredit. Again, serious rectal diseases have often been overlooked and neglected through a sense of false modesty on the part of the patient.

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It is a truth, which is almost axiomatic, that the successful practitioner in diseases of the rectum, as well as in every other branch of medical or surgical practice, is the one who first makes a proper diagnosis, and this can be done only after a thorough examination of the case.

There is not a subject in medicine demanding a more thorough knowledge and greater care, for the reason that diseases of the rectum constitute a common ailment and one in which pain and suffering are almost constant factors, and furthermore, because in no field of our work do proper measures promise greater relief.

I know of no class of diseases in which the surgeon is able to give a favorable prognosis, with more certainty, than in diseases of the rectum. And from my observation I believe that three-quarters of all rectal diseases fall within the category of surgical cases. For a cure we must look to surgery and must not be satisfied with temporizing measures. I have mentioned pain as a symptom of diseases of the rectum, and I wish in passing to emphasize the fact that in almost every instance rectal pain means rectal disease. Possibly the pain may be reflex, but in my opinon, in the large majority of cases, rectal pain points to a rectal lesion.

On the other hand, the degree of the pain is not an index to the severity, but rather in a general way to the location of the trouble. I believe it is a well established fact that the nearer the anal margin the diseased condition is located, be it carcinoma, ulceration, or hemorrhoids, the greater is the pain, and, *per contra*, that lesions high up in the rectum are accompanied by little or no pain. In other words, lesions situated within the sphincterial area,

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are usually accompanied by great pain, while those beyond it are not so painful.

This fact is accounted for in the anatomical structure of the parts, which we will briefly consider. The rectum is about eight inches long and is composed of three coats; the serous, muscular and mucous. The serous coat covers only the upper two-thirds of the rectum, while the muscular and mucous are continuous throughout its length. It is with the portion which has no peritoneal covering that we have to deal in the majority of cases of rectal disease.

The muscular coat is composed of two layers, the outer or longitudinal and the inner or circular layer. The upper portion of the rectum has more longitudinal fibres, while the reverse is true of the lower portion. The circular layer terminates in the internal sphincter muscle, which is about one-half or two-thirds of an inch broad and is situated just above the external sphincter and about one inch from the anus. The mucous coat is thick and vascular. Its great vascularity gives it a dark red color, which is but a normal congestion and should not be mistaken for an abnormal condition.

The mucous membrane of the rectum forms various folds and pockets which have been, and are at the present time, the subject of much disagreement. They are however probably designed to normally increase the calibre of the gut and to hold mucus, the office of which is to act as a lubricant.

The arteries and veins of the rectum are the superior middle and inferior hemorrhoidal, the veins being valveless. The superior hemorrhoidal artery supplies the upper portion of the rectum and helps in the supply of the lower portion, by sending downward terminal branches which run parallel

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with the long axis of the gut. This anatomical arrangement as pointed out by me in a paper on "The Surgical Treatment of Hemorrhoids," read before this society in October 1893, accounts for the fact "That a longitudinal incision of the rectum rarely causes much hemorrhage."* The venous blood from the rectum is conveyed principally from the hemorrhoidal plexus throughout the superior hemorrhoidal veins to the portal system.

The external sphincter muscle is a thin, flat muscle about an inch broad and three or four inches long, arising from the coccyx and being inserted into the central portion of the perineum in front. It is composed of two sets or planes of muscular fibres, which separate to surround the anus, and which, at this portion, are situated just beneath the skin.

The levator ani muscle arises principally from the posterior surface of the body and ramus of the pubes and is inserted into the apex and side of the coccyx. In front of the coccyx the fibres from each side unite with each other to form the median posterior raphé. The largest portion of the muscle is inserted into the sides of the rectum about two inches from the anus, and blends its fibres with those of the sphincters. This muscle also forms the floor of the pelvic cavity. Its action is to support the rectum and the bladder during the expulsive efforts of evacuating either, to compress the rectum during defecation, and to prevent prolapsus of the same.

The nerve supply of the rectum is from the sympathetic and cerebro-spinal systems, the rectum being the only portion of the alimentary tract which is supplied directly from the latter. The nerve supply of the external sphincter is said to

* Vt. State Medical Society, 1893.

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be greater than that of any muscle in the body. These facts explain the extreme sensitiveness of this portion of the rectum as referred to above.

I have insisted upon the necessity of an examination in all cases of rectal disease, hence the question arises of the proper method of examination. First with reference to the position of the patient. The lithotomy position, or the position with the patient on the back and the thighs and legs flexed, is no doubt the best position for all cases. The Sims, or latero-prone position, is suitable for examination of the lower portion of the rectum, and is to be recommended for ordinary cases, especially if the patient be a woman. For examination in either position I use the Rip Van Winkle chair, which is light, cheap, and easily adjusted to any position. For examinations in the dorsal position I use this chair with a pair of extra long stirrups, which were made for me, especially for this work, by the manufacturers, the P. C. Lewis Co., of Catskill, N. Y. A special chair or table, is of course not a necessity—an ordinary table, or a lounge or bed may be used.

The methods employed in rectal examination are inspection and palpation, the former including inspection by the aid of the speculum. Inspection may then be divided into visual examination and speculum examination. Speculum examination will be considered after visual examination and palpation, for reasons which will appear obvious as we proceed. A visual examination will reveal the presence of eczema, fissures, external or protruding piles, the external openings of fistulæ, abscesses, papillomata, condylomata, external ulcers and prolapsus.

By palpation or digital examination we may detect a tight, irritable or hypertrophied sphincter, stricture, poly-

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pus, and tumors malignant or benign, also the condition of the prostate gland, or the condition and position of the uterus as affecting the rectum. I do not, however, agree with those who state that internal hemorrhoids, internal fistulous openings, and ulcers may be easily diagnosed by a digital examination.

I believe it is utterly impossible to make a diagnosis of these conditions by this method, in the majority of cases, and emphatically impossible by the majority of practitioners. Piles which are apparent on inspection, an occasional extra large fistulous opening, or an ulcer with a hard base may doubtless be felt, but ordinarily these conditions must be made out by a speculum examination.

To make a digital examination, anoint the index finger with a proper lubricant, and carefully introduce it into the rectum by a to and fro boring motion, at the same time asking the patient to bear down or strain. This straining down has a tendency to relax the sphincters. The finger once within the rectum, the lower four or five inches of it may be examined by carefully sweeping the finger around over its entire surface.

As regards speculum examinations I will say that I have never employed the same to any great extent and that I use the speculum less now than formerly. The majority of cases of rectal disease may be diagnosed without the use of a speculum, and it is only in occasional cases, and as a means of verifying a diagnosis made by digital examination, that a speculum becomes a necessity.

Piles which are not protruding, may usually be made out by separating the buttocks, pulling out the margin of the rectum and at the same time having the patient strain down as much as possible. Piles which protrude at stool,

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may usually be brought down in this way. Internal piles which do not protrude do not usually require an operation.

The best speculum for ordinary cases, is one made of wire, as the solid specula cover up too great a part of the gut. For examinations high up in the rectum, a tubular speculum is best, and is used with reflected light or a small electric light. A light is often of much assistance in any speculum examination.

From what precedes it remains then that internal hemorrhoids, ulceration of the bowel, internal fistulous openings, and perhaps general proctitis are about the only conditions demanding a speculum examination, excepting cases of stricture, cancer, etc., which can be made out by the finger, and in which the speculum is used as a means of verification and of further investigation.

I have dwelt thus much upon the subject of examinations by the aid of the speculum, not to deprecate the use of the same, in all necessary cases, nor in any case if you please, but rather to bring out emphatically the fact that in investigating the great majority of rectal ailments, a diagnosis may be made by other methods. The simpler methods, when available, are always the best. Furthermore, it is always wise to simplify methods of examination and of treatment as much as possible, in order, by their simplicity or ease in execution, to popularize them with the mass of the profession. The busy practitioner has not time for unnecessary detail or laborious technique, and I wish to make it plain that a thorough exploration of the rectum, sufficient for all ordinary cases, at least, may be made by all of us, without any expensive or elaborate paraphernalia and by an easy and simple method.

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For all examinations, the rectum should be thoroughly emptied, preferably by a saline cathartic followed by an enema, or if time does not permit of this, by an enema alone. The time at my disposal is so short and the subject so vast that I shall in the main be obliged to omit the consideration of etiology, symptomatology, and palliative treatment, taking up only the diagnosis and operative treatment of such conditions as call for surgical measures.

All surgical operations upon the rectum and contiguous structures call for the use of an anæsthetic. Strict antiseptic measures should be carried out in all cases. The question is often asked, "Can antiseptic precautions be used to any advantage in this class of work, can we do antiseptic work in this department of surgery?" To this I reply emphatically in the affirmative.

The patient should be prepared for the operation by a cathartic the night before, and by one or more enemata in the morning before the operation. A bath should be given and the parts scrubbed with green soap and hot water, shaven, and then washed with bichloride solution 1 to 2000. Otherwise all the details of antiseptic surgery applying to the surgeon, his assistants, the operating room, instruments, etc., should be fully carried out. The same may be said of the after treatment.

In operating I prefer the lithotomy position as a rule, and usually use it in hospital work; but in private houses, where appliances and assistance are not so easily procured, I use the Sims position.

We will now consider briefly the surgical treatment of some of the pathological conditions of the rectum.

Fissure and irritable ulcer.—These conditions are often met with and are a source of much discomfort and pain.

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In fact, while apparently trifling in character, they constitute the most painful rectal lesion with which we have to deal. This is due to encroachment upon the external sphincter muscle causing spasmodic contraction of the same. Fissures are situated at the anal margin, while irritable ulcers are usually higher up, but within the grasp of the sphincters. Slight fissures may sometimes be cured by gradual dilatation of the spincter. This is accomplished by the introduction of graduated bougies, or by stretching the muscle with a rectal speculum, using only so much force as the patient can bear without too great discomfort. In either case several treatments will be required, and they should be repeated every day or every other day. As a rule, however, we must depend upon the forcible dilatation of the sphincter, under ether, to cure these conditions.

This should be thoroughly but gently done, by introducing the thumbs, well anointed with vaseline, within the rectum and stretching the sphincter in every direction until it is completely paralyzed. Some surgeons use the rectal speculum for this purpose, but to my mind no instrument can equal the human hand. In cases of large ulcer it is wise to also incise the same by making one or several incisions through it, but I have never incised the sphincter muscle in these cases, and do not believe it proper or necessary.

Other methods used by surgeons for these conditions are cauterization and excision. Thorough dilatation should precede either method, and in my opinion renders both unnecessary. The after treatment consists in placing a light dressing over the parts, held in place by a T bandage. The patient is kept in bed for a few days and the bowels

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moved by oil or a saline cathartic on the third or fourth day. After this a laxative may be necessary each day.

Fistula in Ano.—The varieties of fistula ordinarily met with are complete, blind external and blind internal. By a complete fistula is meant one which has an opening within the rectum and another opening through the skin at the margin of or outside the anus. A blind external fistula is one having an opening into the bowel located, oftenest, between the two sphincter muscles, but no external opening. This is the most troublesome variety of fistula for obvious reasons. Having communication with the intestine it becomes filled and iritated with fecal discharges, with no means of proper drainage.

The history of these cases is, that periodically a swelling appears alongside the rectum, which is troublesome and painful and which contains fecal matter and pus. This tumor may empty itself through the opening into the gut, when the trouble for a short time subsides, usually to be repeated.

When patients present themselves suffering with this condition of affairs it is proper to make an external opening for the sake of proper drainage. In many cases of fistula in ano we find more than one sinus, and in some cases several, due to the burrowing of confined pus, also small pus cavities, and sometimes several external openings.

What is known as a horse-shoe fistula, is one with one internal and two or more external openings. Occasionally we observe complete fiistulæ having both openings located internally, or again those having both located externally.

Many procedures have been devised for the cure of fistula, including dilatation of the sinus and its external

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opening for the sake of drainage in the hope that the sinus may fill by granulation, injection of astringents, ligation, division by the knife, and excision.

The best method, and the only one to be relied upon in all cases is division. Of the two first named methods I have not time to speak at length, and perhaps it is unnecessary, as both are little more than palliative and neither can be relied upon to produce certain results.

Ligation may be applicable to a few cases, in which there is but one sinus and that superficial. This method consists in threading the sinus with a silk or elastic rubber ligature, through its external opening, bringing it out through the internal opening and through the anus, and in tying it tightly or fastening it with a split shot in case of the rubber elastic, so as to constrict the surrounded mass of tissue. It is left to cut its way through the tissues, a process which may require several weeks' time. The method is painful, unscientific, and uncertain, accomplishing in weeks what may be accomplished with the knife in seconds.

The operation by division with the knife is carried out as follows, the sphincter first having been divulsed. If the fistula is complete, a flexible probe-pointed grooved director is entered at the external opening and passed carefully along the sinus, which is very likely crooked and hard to follow, but by gentleness and care we will usually succeed and will be able to pass the director on through the internal opening, by the aid of the forefinger in the anus. This done, the director is brought out at the anus, and the tissues external to the director are divided by a sharp pointed bistoury, at a right angle to the sphincter.

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In case we are unable to find the internal opening, or having found it, are unable to pass the director through it on account of the tortuousness of the sinus, and again in the case of a blind external fistula, when the probe has gone as far as it may in the sinus, it is forced through the remaining tissues and the mucous membrane and brought out at the anus, as above described.

In case of a blind internal fistula, a probe-pointed director is entered at the internal opening and pushed along the sinus as far as it will go. The point of it may now be felt beneath the skin and will be liberated by a cut through the latter with the scalpel. This converts it into a complete fistula and the tissues are divided as above described. In many cases of fistula the above procedures are easily carried out and constitute the least important part of the operation.

Other sinuses exist and must, every one of them, be found and thoroughly opened, else the operation will prove a failure. Upon the thoroughness of this part of the work depends the success of the operation. All the sinuses should now be curetted, or incised along the bottom with a scalpel or both, according to the amount of induration present, and the lips of the external opening should be trimmed. In some cases it will be better to completely excise the indurated tissue.

This operation for fistula, in cases where many sinuses have been dealt with, is often very complicated and laborious, and requires much skill on the part of the operator. This is especially true in the horse-shoe variety of fistula, with two or more external openings. It requires much patience and skill to connect all the external openings by incision, tracing their communication with the main sinus

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from the gut, and then open this sinus, as in the other cases described.

This is the only proper procedure, as it is inadmissible to cut the sphincter muscle more than once at one sitting as control of the anal outlet will surely be sacrificed. If the directions given above for simple cases be carried out here, and the director be entered at each external opening and pushed into the rectum and the tissues divided, then we shall sever the sphincter in two or three places when incontinence will surely follow.

I have mentioned the necessity of always cutting the sphincter at right angles. If it is cut obliquely the severed ends of the muscle may not unite properly and sphincteric control may be lost. The after treatment consists in packing the wound with gauze, applying an antiseptic dressing and a T bandage. The packing should be renewed at the end of twenty-four or forty-eight hours, and later, every day whenever the bowels are evacuated.

I have said that much skill is required in doing these operations. The same is true of the after treatment. If this is not properly carried out we fail to effect a cure. All the sinuses and pockets which have been opened up, must be kept packed so as to prevent union by apposition and insure granulation from the bottom.

The operation by excision consists in opening the sinus as before described, dissecting it out thoroughly, and uniting the freshened surfaces by deep sutures, something after the method in perineorraphy. The method is not adapted to cases where we have extensive sinuses or cicatrices and union of the entire tract by first intention is hard to secure, except in the simplest cases.

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Dr. J. M. Mathews of Louisville, Ky., has invented an instrument called the fistulatome, which may be useful in selected cases, and where patients object to radical measures. It is patterned after the urethrotome, having a hidden blade upon two sides. It is inserted with the blades hidden, through the external opening, the blades are released and the instrument is withdrawn, thereby incising the sinus upon two sides. I have had no experience with the instrument, but believe it may be valuable in some cases, where we have to deal with but a single sinus.

Hemorrhoids.—The methods principally used by surgeons to-day for the cure of piles, are ligation and the operation by clamp and cautery. The operations by crushing and by excision of the pile bearing area, are used by some operators, but have not become generally popular. As to the superiority of the operation by ligature or by clamp and cautery there is considerable diversity of opinion, but with the balance largely in favor of the ligature. In all operations for hemorrhoids by whatever method the sphincter must be thoroughly dilated. This, in my opinion, is an all important part of the operation.

Two methods of ligation are in vogue. By one method the pile tumor is caught with a pair of pile forceps or an ordinary clamp and drawn down. An incision is made with a pair of scissors or a scalpel along the junction of the skin and mucous membrane and continued up the gut along the sides of the tumor, until the latter is left attached only by healthy mucous membrane above and by the vessels which supply it. If the pile tumors involve an extensive cutaneous outgrowth this should be included by the incision around the tumor. A strong silk ligature is thrown around the pedicle thus formed and tied tightly and securely, on the

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upper side, so as to get beyond the grasp of the external sphincter. The outer half of the tumor is cut off. All the larger tumors, usually not more than four or five in number, are similiarly dealt with, and all are returned within the sphincter. By the other method of ligatisn no cutting is done, but the tumors are transfixed through the base with a needle carrying stout silk, and the ligatures are tied tightly, one either side, and the tumors are cut off as before described.

The question arises as to the superiority of one method over the other. A strong plea is made for the latter method by Mathews in his work on diseases of the rectum. Personally I prefer the method first described. Having cut the tumor partly from its attachment, less work is left for the ligature to do, which means that the ulcerative process will be less extensive. The ligatures will come away approximately, a couple of days earlier, and convalescence will be thus much shortened. My experience leads me to believe that it is somewhat less painful and leaves less cicatricial tissue.

In the operation by clamp and cautery, the tumors are singly drawn into the clamp which is applied in the long axis of the gut. The clamp is screwed tight and the tumor, if large, is cut off with scissors, after which it is thoroughly seared with the thermo-cautery at a dull red heat. If there is one precaution more than another to be observed in this operation it is to avoid cutting off too much of the tumor before applying the cautery.

Failure on this point is the most frequent cause of hemorrhage. If the tumor is large cut off part of it, leaving a stump about a quarter of an inch in thickness, if it is small do not cut it, and in every case burn it down thoroughly

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with the cautery. This, in my experience, is the secret of avoiding hemorrhage in this operation.

It is claimed by those who specially advocate this method, that it is superior to the ligature, because it can be more quickly done, causes less after-pain, and results in earlier healing of the parts. From this opinion I must dissent after having given both methods a thorough trial. It requires but little dexterity to do the operation by ligation as quickly as with the clamp and cautery. The after pain is not less, so far as my observation goes, than after ligation. I am still of the opinion stated in a previous communication (Trans. Vt. State Medical Society, 1893) "that pain after the operation depends more upon whether or not a portion of the skin has been cut or burned than upon the method employed," provided also in both cases that the sphincter has been thoroughly divulsed.

Upon the third point I have made careful comparison in private cases and in hospital work, and I do not find that a cure is effected quicker with one method than with the other. On the other hand, there is no doubt but that the operation by ligation is the safest. This is the opinion of surgeons the world over, and is proven by statistics. Now, safety from hemorrhage is the principal criterion, and constitutes the only necessity for the use of either the ligature or the cautery.

The clamp and cautery operation is not applicable where the patient is weak or anæmic, or where the tumors are large and very vascular. Again, one point which especially commends the ligature operation, for the general practitioner at least, is the fact that it requires no special instruments. The operation completed by any of the methods described, a small piece of gauze is inserted

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within the anus, between the stumps of the tumors, and the parts covered with an antiseptic dressing held in place by a snug T bandage.

Whitehead's operation, in my opinion, is seldom indicated, but in case it seems wise to excise the whole pile area, a better operation would seem to be one originated by Dr. Henry O. Marcy of Boston, which consists of excision, prevention of hemorrhage, and closure of the wound by buried tendon sutures.

The time at my disposal will allow of only a brief consideration of the conditions of ulceration, cancer and stricture of the rectum. I have devoted most of my time to the more common rectal troubles, believing that this course would be most profitable.

Ulceration of the Rectum.—Clinically all cases of rectal ulcers will fall within the category of simple, syphilitic, or tubercular ulceration. While the greater number of cases undoubtedly are syphilitic in origin, there is no doubt that many cases are due to the breaking down of tubercular tissue.

The successful surgical treatment of these two forms of rectal ulceration is impossible, without proper constitutional treatment. In syphilitic ulceration we may depend upon mercury and iodide of potassium. In tubercular cases there is of course no specific, and we must not look for repair of the lesion, unless we can improve the constitutional condition.

In cases of simple ulceration, dilatation of the sphicter and application of pure carbolic acid or of a solution of nitrate of silver, thirty or forty grains to the ounce, repeated at intervals of three or four days, will be the proper treatment, and will usually result in a cure in a short time.

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The same treatment will apply to tuberculous ulceration, but must often be extended over several months time. It will sometimes be necessary to incise the ulcer and the sphincter as well, for the sake of perfect rest to the parts.

In syphilitic ulceration, in addition to the foregoing, it may be necessary to thoroughly curette the base of the ulcer, and apply lunar caustic or to use the thermo-cautery. In all cases continued rest in bed and a light or liquid diet is a necessity.

Cancer.—One of the most serious conditions met with in surgical practice is cancer of the rectum. Many cases are not seen by the surgeon until the disease has made considerable progress, and the question of operative interference is one of vital importance, calling for careful judgment on the part of the operator.

Will the disease recur and in what length of time, will the patient live longer or more comfortably, will the local condition be better, will the operation save life? These are some of the questions which enter into a consideration of the advisability of an operation for cancer of the rectum, and every case must be settled on its own merits.

However, one rule of surgery must not be deviated from, and that is to operate only in those cases in which the entire growth, together with the infected lymphatic glands, can be safely removed. Cases in which the bladder or prostate gland are much encroached upon are not favorable for operation.

Excision of the rectum by the method of Allingham, and the Kraske operation, are the radical methods mostly in vogue at the present time. The latter is to be preferred, where applicable, for it leaves the patient with control of the bowel, as it preserves the sphincter muscles.

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Upon the subject of colotomy for rectal cancer, I will say that I do not believe it indicated except in the rarest cases, and as a last resort.

Benign Stricture. In some cases of benign stricture, dilatation by means of bougies gives relief for a time, but is not curative. The stricture contracts gradually in spite of the treatment, resulting finally in obstruction of the bowel. The best method for dealing with this condition is posterior proctotomy, which consists in making a free incision posteriorly through the constriction, and extending it downwards through the sphincters and intervening tissues. This relieves pain and admits of free drainage and the easy discharge of fæces.

After-contraction must be prevented, if possible, by the passage of bougies. When obstruction results, in spite of the above methods, lumbar or inguinal colotomy—my preference being for the latter—promises relief and gives the patient new lease of life.

The indications for colotomy in the conditions of cancer and of benign stricture are not at all parallel. In the former it probably does not prolong life, while in the latter it may do so indefinitely.

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Puerperal Fever.

By J. M. Hamilton M. D., Proctor.

Mr. President, and Gentlemen of the Vermont Medical Society:

I assure you that it is with many misgivings that I come before you to-day with a paper on any subject. My province is to listen, but since your committee has beguiled me to be so presumptive, I shall present for your consideration a subject that interests us all, puerperal fever. My plea must be that we all strive to avoid it, for nowadays and most properly too one's reputation is not good in proportion to the number of his cases of puerperal sepis that recover but in proportion to the number of cases he prevents.

That puerperal fever—so called—is caused by germ infection is now an axiom and all the old theories of spontaneity and suppression of lochia, one after another of which have prevailed until recent years, are exploded and every one admits puerperal fever to be puerperal infection. Some wound in the genitalia as a rule, has been innoculated with the germs—not of puerperal fever, for such do not exist independently,—but with some of the pyogenic germs. There may be cases in which the particular wound infected cannot be discovered: a small nick in the perineum or cervix, or a slightly abraded vaginal wall, offer good entrance to the germs. The placental site, however, is most common seat of infection.

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Puerperal fever includes, then, all cases of fever occuring during the puerperium caused by infection of some of the pyogenic germs.

The puerperal state extends from the termination of the third stage of labor until the time the mother has returned to her physiological unimpregnated condition, usually from seven to ten weeks, according to circumstances.

Puerperal fever is divided by some into two classes, according to cause. The first class they say should be called sapræmia because caused by the saprophytes, the germs of putrefaction; the other, septicæmia proper caused by the pathogenic germs—streptococci, staphylococci, etc. Sapræmia is noncontagious and is due to the absorption of putrefying material within the uterus. The second class, which is of much more serious type, is caused by parasites which unlike the saprophytes, enter the circulation and the disease thus becomes general. That the milder form is followed by the more severe is accounted for by the fact that the action of the saprophytes creates a most desirable soil for the growth of the streptococci and staphylococci.

The other division, which seems more accurate, is into toxæmia and septicæmia. Both forms are caused by the same pathogenic germs. Usually the saprophytes are found in septicæmia, but so are the pathogenic germs in sapræmia—so called. Occasionally, however, this condition does not exist without the presence of the streptococci and stapylococci. If such be the case the removal of the dead tissues with the curette and douche–for the saprophytes never attack living organic matter–and a brisk cathartic will speedily relieve all the trouble.

But when the pyogenic germs have infected a wound, the living tissue is invaded and there is a local inflammation

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with all the classical symptoms of heat, pain, redness and swelling. Thus, we have what might be called the first stage, or stage of local inflammation, or, if the term of inflammation be limited to mean the normal process of repair, we might call it the stage of local infection. The growth, development and reproduction of these germs produce a tox-albumin which, unless quickly eliminated, will be absorbed by the system and symptoms of fever, rise of temperature, quickened pulse, headache and loss of appetite will supervene and the patient enters the second stage of toxemia. The continued action of these poisonous germs will be to weaken the tissues and break down the safety wall produced by the leucocytes against their mortal enemies, and these cells will be disintegratad and discharged as pus, and no barrier will remain to prevent the entrance of the parasites themselves into the circulation. This will soon occur and septicæmia will be upon us with all its horrors of chill, fever, purulent discharge, headache, delirium, etc.

Leaving out of consideration, then, sapræmia, which rarely exists alone, we find the divisions of puerperal fever to be,

I. Local infection,
II. Toxic absorption,
III. Septic absorption.

There is a form of septicæmia, however, which runs its fatal course in from a few hours to two or three days at most. Undoubtedly the stage of local infection is present but it is so slight in comparison to the septic poisoning that it is overlooked.

The micro-organisms that usually cause pueperal fever are the streptococcus pyogenes, staphylococcus aureus, gonococcus and according, to some, the baccillus coli com-

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munis and the germs of diphtheria. There may be a mixed infection caused by two or more of these varieties, usually the streptococcus and staphylococcus. Of these, the staphylococcus is the most mild, the streptococcus the most virulent and the gonococcus the most difficult to subdue.

The means of communication are similar to those of infecting a wound in any other part of the body—the hands of the physician and attendants, by instruments, dressings, the air and by auto-innoculation. Auto-infection is now regarded skeptically by many observers. Steffick found pyogenic micrococci in the vaginae of twelve out of twenty-nine pregnant women examined, none of whom had been subjected to digital examination, and believes that auto-infection might occur. Krönig, Döderlein, Von Ott and Menge claim that auto-infection is impossible for the reaction of the normal vaginal secretion is too acid for the multiplication of pyogenic germs. All admit that these germs are found there sometimes, though in an attenuated condition.

Dr. Lingi Acconci says, "It will not do to trust to their innocuousness," for changed conditions may call them to renewed action and the result would be disastrous. But the germs by which auto-innoculation is the most liable to occur are not the strepto-or staphylococcus but the gonococcus. There can be little doubt that many cases of puerperal fever, the cause of which cannot be made out, are due to auto-innoculation from a previously existing gonorrhea.

Dr. Albert H. Burr of Chicago gives the history of six cases—three fatal—of puerperal septicæmia, undoubtedly caused by the gonoccoccus. These women were infected before pregnancy. Dr. A. P. Davis of Philadelphia in the August number of the American Journal of Obstetrics re-

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ports two cases of auto-innoculation by the intestinal bacteria. These germs, if introduced into a healthy vagina or uterus, would probably soon be overcome and discharged, but in the puerperal there is a condition very similar to the convalesence from some serious illness. The vitality is lowered by fatigue, the nervous system weakened by the excitement of child birth and besides that, there is the large physiological wound that affords a most desirable home for bacteria.

It is beyond the scope of this paper or the ability of the writer to study in detail the symptoms, diagnosis and treatment of all the varieties of puerperal septicæmia that may arise from innoculation in different parts of the genital tract.

Since the endometrium is by far the most common point of innoculation, I shall omit consideration of primary infections occurring at other points.

The symptoms of simple endometritis are perhaps a chilliness at the beginning, but this is not a constant symptom, severe after pains, the uterus enlarged and very tender, the cervix swollen and os generally dilated, headache, temperature and pulse about 100.

The prognosis of this simple endometritis is good, recovery usually taking place in a week or ten days. One point in the treatment of this simple inflammation may be mentioned here. When there is any abrasion external to the uterine cavity, Garrigues recommends that it be cauterized to prevent any absorption through it. He uses equal parts of chloride of zinc and water, while Dr. J. Z. Currie of Cambridge, Mass., advocates the use of stick nitrate of silver quickly applied.

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An increased temperature or chill will indicate that some of the chemical products of the germ life are being absorbed. The symptoms of this stage that we have termed puerperal toxaemia resemble very much the so-called sapræmia, and indeed the two may co-exist. The local symptoms are the same as in the stage of local infection except aggravated, the lochia probably purulent, and usually there is a chill.

The temperature runs to 103 or 104 and pulse to 110 to 120, and weak, the bowels loose, headache severe, perhaps delirium; appetite and courage gone. Death may result from this without the introduction of the third stage of septic absorption. The distinction is made by the fact that no local infection occurs in organs distant from the point of primary innoculation.

If the germs themselves are taken up by the circulation the announcement is made by a rapid rise in temperature, and usually by a severe rigor. Dr. Wm. T. Lusk says that the intensity of this chill offers no criterion by which to judge the severity of the attack. The chill may be marked and prolonged that ushers in a low grade of infection while a chilly feeling, or no chill at all may precede the acutest form of septicæmia. The walls of the uterus cannot be made out by external manipulation; the cervix is large, soft and flabby; the fetid lochia are purulent and perhaps bloody, diarrhea marked, the abdomen usually distended and tympanitic; the pulse is rapid, feeble and fluttering; the temperature 105 to 106; headache is intense; there may be delirium or coma, and death may seem inevitable. Besides these symptoms there may be repeated chills that mark the development of metastatic abscesses in various parts of the body; the lungs, liver,

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spleen, joints, meninges and the eye are the most frequently affected.

The prognosis in this case must be exceedingly guarded, as there are many elements to be considered ; age, temperament, surroundings, former health, family history, length of time since confinement, etc. The dangers of endometritis are enhanced by the possibility of extension to surrounding parts. The walls of the uterus are frequently invaded and the germs occasionally follow up the tubes and a purulent salpingitis develops. With the exception of metritis perhaps the most common is peritonitis, either localized or general, and of these all know the prognosis. Another of the dangers of endometritis is that infected thrombi may enter the circulation through the open uterine sinuses. Metastatic abscesses are often caused by these emboli and phlebitis is frequently the result.

The treatment is a point in which all are most interested.

FIRST AS TO PROPHYLAXIS.

The present state of knowledge of bacteriology is showing almost its best effect in saving child bearing women from the dangers of puerperal septicæmia. Now the obstetrician or general practitioner who attends his cases without the greatest care to have his hands and instruments not only scrupulously, but surgically clean, is considered an offender against the very fundamental principles of modern medicine.

Many are the methods now recommended for cleansing the hands. Perhaps after all discussion, the best is to wash thoroughly with soft soap and water, scrub with brush, and clean tips and roots of nails with knife. After this, scrub the hand in 1:1000 bichloride solution and soak for five

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minutes in same solution, or better still in 95% alcohol. After this procedure the hands may be considered safe unless there has been contact with some virulent material, for example, a case of erysipelas or septicæmia or a post mortem. All authorities seem to agree that the virulence of the streptoccocci is increased by developing in living media. When they have lived a saprophytic existence they become attenuated and the infection resulting from them will be correspondingly mild. Besides the hands, the instruments must be rendered sterile. This is best done by boiling. The bedding, too, must be at least clean and fresh from the wash. Heedlessly allowing the people to "save the bed from the muss" by putting a soiled sheet under my patient during the delivery of a three month's fœtus was undoubtedly the cause of the infection that followed. The woman's toilet should be made most carefully; the pubes, thighs and external genitals should be thoroughly cleansed and washed with antiseptics. As to antepartum vaginal douches, there is considerable discussion. Dr. Lusk, in a paper read before the College of Physicians of Philadelphia in January in regard to both ante and postpartum douches says, "The antiseptic douches dissolve the mucus, set free the imprisoned germs, weaken the resistance of the tissues and contribute to the extension of the sources of infection." In the discussion that followed, several prominent medical men favored the antepartum vaginal douche and an equal number disapproved its use. It seems to me the safest rule to follow would be: when the vaginal secretions have been apparently normal, and there has been no history of gonorrhea or any purulent inflammation of the genital tract during pregnancy, no douche should be used; but if there be a history or suspicion of these diseases, use the douche thoroughly, for, as be-

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fore stated, gonorrhea is the most common cause of auto-infection. Rectal injections should be given to insure against fæcal contamination during delivery. It goes without saying, that since the danger of infection is increased almost in direct proportion to the number of digital examinations these should be as few as possible. When they become necessary, the hand should be disinfected before each one in the bowl of hot corrosive solution that is always near-by. Carbolated vaseline should be used when any lubricant is required. No pains should be spared after the delivery of the placenta to make sure that no shreds remain in utero. An intra-uterine douche of a mild antiseptic is of the greatest value in cases where the digital examinations have been at all extensive. and most surely should be used if there has been any instrumental interference.

The treatment of puerperal fever in any of its stages must be both local and constitutional. The local aims to prevent absorption through the wound, while the constitutional aims to overcome the damage done by any toxic or septic matter already absorbed. Locally, secure absolute cleanliness of the endometrium at the earliest possible moment. I believe that in the early stages of the disease there is no procedure so good as the use of the curette if immediately followed by a large amount of water having a free exit to remove every particle loosened by the instrument. The use of the curette without the irrigation is altogether harmful. After the free irrigation douches of 1-4000 bichloride should be given every five or six hours for a time to prevent further infection. If the temperature is not soon reduced and the distressing symptoms overcome, no time should be lost before more positive means are adopted. The interior of the uterus should be thoroughly cleansed and then packed

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with iodoform gauze. I can add to the testimony of others my firm belief in the efficacy of this method. But the tamponade without disinfecting the endometrium as thoroughly as possible before its use and making sure that all steps are done under the strictest antiseptic precautions, cannot give the desired results. Moreover, the greatest care must be used in introducing the gauze as well as in the employment of the curette in the preliminary step. The walls of the uterus may have become impregnated with septic material and so weakened that this operation, simple in itself, would puncture them, and undoubtedly the result would be a fatal peritonitis. In the Boston Medical and Surgical Journal a case is reported in which the walls of the uterus were punctured and a loop of intestines drawn through the wound. In the same volume Dr. Garrigues tells of a post mortem after puerperal metritis in which the uterus would not hold its own weight when suspended on a sound. The greatest care must be exercised and, moreover, the curetting must be done early before the muscular coats of the organ are involved. If the general symptoms are favorable this packing should remain forty-eight hours, at which time a douche of 1-4000 bichloride solution should be used, followed by sterilized water. Then the packing is to be repeated as before, packing quite snugly at the fundus and more loosely towards the cervix, leaving a strip protruding from the external os. If any untoward symptoms continue this packing may be repeated several times, using less gauze each time as the muscles resume their natural tone. If the muscles are lax but seem free from invasion ot the streptococci, it is well to give ½ dram Squibbs ergot half an hour after each tamponade. When all signs of septic absorption have disappeared and the douche brings away no purulent material,

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the gauze may be omitted and daily douches of bichloride substituted.

In one case following abortion, I had one per cent. solution of lysol used for irrigating. The temperature rose each afternoon and the lochia coutinued purulent. I instructed the nurse to use the bichloride and in three days all unfavorable symptoms were gone. Although many eminent obstetricians are not in favor of this method, I believe on the whole more good can be done here in the country by the use of the douche, curette and the douche and tampon than by any other means at our disposal. Many operators are now recommending hysterectomy for the cure of endometritis, or, more especially where there is evidence that the deeper layers are involved. The greatest difficulty among the advocates of the operation seems to be to decide at what time it should be performed. Dr. Alfred C. Carpenter, of New York, says: "when the second chill occurs and there is no longer doubt about the diagnosis, there is no alternative." This seems to be rather a serious operation to perform for the relief of a disease that has such a low mortality rate. The operation performed too late is, like all others, useless; while one performed until other methods have failed may needlessly sacrifice the organ. The matter is yet young and it is impossible to say what place it may take in operative surgery. Undoubtedly, however, many successful cases are being reported where no other method could have saved life. The constitutional treatment, as stated before, must be to overcome the damage already done by toxic and septic materials absorbed, so we must strive to build up the resisting power of the system. This is done especially by the use of foods. Milk, beef tea, broths, egg water, and egg-nog should be given at regular intervals to the full extent

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of tolerance. Stimulants, too, should be used freely. Keep the heart regular and as strong as possible by the use of digitalis, strophanthus and strychnine, the last of which should be given throughout the disease. Most authors advise the use of quinine in doses of thirty to forty grains in twenty-four hours. This is used both for its antipyretic and antiphlogistic properties. As a rule, the temperature can be reduced better by the use of cold water, either in the form of a sponge or full bath or in extreme cases by the cold pack. The temperatnre will be quickly lowered with the least disagreeable after effects and other symptoms will not be masked by its use. For this purpose, next to cold, I would place phenacetin. The general effect is much superior to any of the other coal tar preparations.

Since the great success of the diphtheria antitoxin, many are hoping for a revolution in methods of attack on the bacterial world. For some years enthusiastic bacteriologists have been working to obtain a serum from immunized animals that would overcome septicæmia. That they have produced an antistreptococci serum there is no doubt, but it has not been of so much assistance practically as all would hope.

I take the following extract from a paper read in May by Dr. B. C. Hirst of Philadelphia. There is a streptococci infection so virulent that the antitoxine will be of no avail, no matter how strong it may be. There is an indeterminable time in streptococcic infection when the serum will be too late. The antistreptococci serum has no antagonistic power over other pathogenic microorganisms. It is not easy to determine during life whether the infection is pure or mixed, though the majority of puerperal infections are due to the streptococci. Where-

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fore, the use of the serum must be more or less empirical. Finally, the clinical results of serum therapy for puerperal infection have not been, as yet, at all encouraging.

I would like to add the history of one simple case that illustrates what has been said.

Mrs. A., an American lady, with slightly contracted pelvis, anæmic, but otherwise in good health before delivery. With previous child she had tedious labor. At this time, pains began in the early morning and she was delivered by Elliot's forceps under chloroform of a nine pound girl at 8 P. M., Feb. 25th, 1896. No pains were spared to make everything aseptic. A large amount of meconium was discharged into the genital tract during delivery. Antiseptic douche was used after delivery of placenta. Her temperature ranged between 99 and 100½ until the forenoon of Feb. 28th, when, during my absence, she had severe cramps in left leg. At 6:00 P. M. her temperature was 103.5; pulse and respiration rapid; expression anxious; very little tenderness over uterus. Gave an intra-uterine douche of corrosive water; returned clear, bringing no shreds. The following day her condition seemed improved. Temperature 102; no pain or tenderness. In the evening her temperature was again 103. March 1st and 2d were very good days. She received an intra-uterine corrosive douche morning and night and seemed to be steadily gaining. I began to think her trouble due to inflammation of the breasts which the nurse had allowed to become distended with milk. But on the morning of March 5th she had a severe rigor and the temperature jumped to 105.5. The uterus was then large and soft but no severe after pains or purulent lochia. Notwithstanding this, I curetted thoroughly with a sharp instrument, and after the use of a

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large antiseptic irrigation which brought away only shreds of the endometrium, I introduced a tampon of iodoform gauze. In a few hours the patient seemed greatly relieved; the temperature dropped to 102 and the pulse became more regular. As every symptom seemed favorable, the gauze was left in place for forty-eight hours, and then replaced by a smaller quantity, the corrosive douche being used.

The cervix at this time, March 5th, was becoming more solid and this I believe to be one of the first indications of improvement. The constitutional treatment was nourishing and stimulating. The packing was repeated four times and then daily intra-uterine douches substituted, which in time gave way to the simple vaginal douche. Her condition rapidly improved and I dismissed her in perfect health March 14th, 1896.

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The Operation of Shortening the Round Ligaments, Its Indications and Technique.

By E. H. Ross, M. D., St. Johnsbury, Vt.

Mr. President, and Gentlemen of the Vermont State Medical Society:

Any operation undertaken for the relief or cure of diseased conditions should have for its prime object the restoration of the parts to as near the normal condition as possible. This is true of Alexander's operation when undertaken for the relief of:

(1) Retroversion or retroflexion uncomplicated.

(2) Retroversion or retroflexion with prolapsed ovaries.

(3) Retroversion or retroflexion with adhesions.

(4) Retroversion or retroflexion with prolapse of the uterus.

(5) All cases of prolapse or procidentia.

My reasons for making the above statement can best be explained by considering for a moment the normal anatomical condition of the uterus as compared with the pathological conditions already mentioned.

The uterus normally is a freely movable organ, being suspended in the pelvis and held in position largely by its

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ligaments, the utero-sacral behind, the broad ligaments on either side and the round ligamenis and utero-vesical in front.

When from loss of the support of the perineum, due to its rupture in child-birth, or when the uterus from repeated congestions becomes too heavy, these ligaments yield gradually under the strain and the uterus sinks down in the pelvis, taking any one of the positions of displacement determined by the conditions then existing. Or the same result may be reached after child-birth, when the ligaments are relaxed, if involution does not proceed normally and the heavy uterus prevents the ligaments from regaining their natural condition. When this state of affairs is reached, the interference with circulation, and the innervation consequent upon it naturally tend to increase the difficulties and the woman begins to complain of all the symptoms with which you are so familiar. To relieve these symptoms, you must raise the uterus to its normal position and keep it there. This can be done sometimes by pessaries. But pessaries are annoying and require frequent attention.

Let us see what takes place when the round ligaments are shortened. Starting as they do from the anterior superior portion of the uterus, they extend outward and forward, lying between the folds of the broad ligaments, to the internal abdominal rings, then on through the inguinal canal to become lost in the fatty tissue of the mons veneris. Now as they are shortened, by drawing them out through the inguinal canal, they lift the uterus upward and forward, at the same time acting as purse strings in the broad ligaments they shorten them as well and tend to lift the ovaries, if prolapsed, at the same time.

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When they are securely fastened to the pillars of the external abdominial ring the uterus is held firmly in its normal position and condition by two firm, fibrous cords which have incidentally shortened the elongated broad ligaments. The uterus is not firmly attached to the abdominal walls but is free to move as it normally should. The circulation is restored, and it is surprising to note what a change takes place in a heavy, congested uterus after the operation, especially if it be curreted at the same sitting to help relieve the endometritis which is almost always present.

The operation has been opposed by many for various reasons among which are:

(1) That the ligaments are often absent and are difficult to find.

(2) That it is a dangerous operation.

(3) That it interferes with subsequent pregnancies.

(4) That its results are not permanent because the uterus returns to its former position after labor.

(5) That it may give rise to serious secondary symptoms.

In reply to these, I would say:

I. It is generally admitted that they are rarely absent and a failure to find them is usually the fault of the operator. During my service at St. Elizabeth's Hospital, Boston, it was my good fortune to see forty-four cases operated upon and have the care of them during convalescence. In one of these cases the operation had already been attempted and the woman told she had no round ligaments. Still they were present and of good size. I have operated on only four cases myself and found the ligaments readily in all but one of them. In this case I failed to

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find the ligament on one side. This was due, I think, to not following closely enough my land-marks.

II. I cannot see why the operation should be considered any more dangerous than any plastic operation. The abdomen is not opened and there is no need of suppuration even if the ordinary rules of asepsis or anti-sepsis are observed. In the forty-eight cases which I have followed through their entire convalescence and three more in which I assisted in the operation, I know of but one death. That occurred from pneumonia and could in no way be attributed to the operation.

III and IV. In the reports of cases that I have been able to refer to, I find records of fifty pregnancies which went to full term. I have not found mention of any cases of abortion due to the operation. In all but one of these cases the position of the uterus was normal some months after confinement. Alexander himself claims that pregnancy is favored by the operation.

V. From reported cases which number several hundred, the only serious secondary condition which I can find, is hernia, and this only in six instances. They were all easily controlled with a truss. When carefully done I do not see how a hernia can result from it, as the internal abdominal ring is completely closed by the ligament.

There is occasionally some vesical irritation during convalescence, but it is usually easily overcome.

I recall one case in which there was considerable pain in the incision and extending down the thigh. This was probably due to the injury to the nerve which was broken while pulling out the ligament on that side.

Abscess formation in the incision occasionally occurs but can be avoided by paying close attention to asepsis.

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It delays convalescence but does not interfere with the result. I have never known it to cause any unfavorable symptoms.

PREPARATIONS OF THE PATIENT AND OPERATOR.

Twenty-four hours before the operation the bowels should be moved by a saline or castor oil. The night before the mons veneris should be shaved and the abdomen thoroughly scrubbed with soap and water, then washed with ether and a compress of cotton soaked in a 1-1000 solution of bichloride of mercury applied. This is held in place by a binder and is not to be removed until the patient is on the operating table. One hour before the operation, two ounces of whiskey are given by the rectum, and half an hour before etherization 1-100 gr. atropia is given by the mouth. When placed on the table, the compress referred to is removed and the abdomen again scrubbed with soap and water followed by bichloride 1-1000. As soon as the patient is etherized the bladder is emptied with the catheter and the vulva and vagina thoroughly cleansed with soap and water, followed by bichloride. The operator has already prepared himself by scrubbing hands and forearms for five minutes and soaked his hands in bichloride 1-1000, or if he prefers, in a saturated solution of permanganate of potassium, removing the stain by washing in a saturated solution of oxalic acid.

The room, tables, etc., are prepared as for a laparotomy. The instruments and ligatures are boiled. The towels and sponges (of gauze) are steamed.

In most cases it is best to curette the uterine cavity with the sharp curette before going on with the operation

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because of the almost invariable complication of chronic endometritis.

As a guide in making your incision, I think the landmark suggested by Dr. F. W. Johnson, of Boston, the most reliable. This is the spine of the pubis. Locate this carefully on each side. Then make an incision, obliquely, from without inwards, stopping the lower end of it directly over the pubic spine. Carry this down to the tendon of the external oblique which will be recognized by its white glistening appearance Stop all hemorrhage as you proceed, but use as few clamps as possible to avoid bruising of the tissues. Clear away the fat and tissue so that you can see the tendon clearly. Often the external ring can now be clearly seen. Occasionally the inter-columnar fascia is so dense that the ring does not show plainly. In either case, keeping the spine as your landmark, cut through the inter-columnar fascia and a bunch of fat will protrude. Grasp this, avoiding the fascia at the sides and beneath, and tease the whole mass out carefully, including the nerve. After a moment you can distinguish the ligament by its yielding slightly as traction is made. Separate it from the nerve and fat, taking care to bruise the nerve as little as possible. The ligament is small at first but rapidly becomes larger. Avoid pulling it out too far or you may pull a pouch of peritoneum along with it and unintentionally open into the peritoneal cavity.

Having secured both ligaments pull them out until the uterus is raised into a position of slight anteversion (as determined by vaginal examination), but avoid bringing it into contact with the abdominal walls. While held in this position the ligaments are to be secured to the pillars of the ring by passing three sutures on each side. The

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wound is then washed with hot sterilized water and closed without drainage. The slack of the ligaments may be left in the wound, or if much bruised it should be cut off, first ligating the ligament to avoid hemorrhage from the artery in it. The line of incision is dusted with aristol or acetanilid and covered with sterilized gauze, which is held in place by an abdominal binder with perineal straps.

The sutures used to secure the ligaments should not include too much of their substance or strangulation and suppuration may result. If the case is one complicated by adhesions these should first be loosened by a long course of packing or else broken up by passing the finger through an opening in the vaginal fornix.

The patient is kept in bed two weeks. The bowels are moved by a saline at the end of three days. To prevent vesical irritation the bladder should be emptied every four or five hours, preferably without a catheter. The sutures are removed in from five to seven days.

If suppuration occurs the wound should be reopened at once and packed with acetanilid, allowing it to heal from the bottom.

The operation is indicated as already pointed out in retroversion and retroflexion whether complicated by adhesions and prolapsed ovaries or not, and in all cases of procidentia and prolapse especially when such cases cannot be cured by pessaries or when the patient wishes to be freed from the annoyance and inconvenience of wearing them.

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Opium. Its Uses and Abuses.

By F. W. Comings, M. D., Derby, Vt.

Mr. President, and Gentlemen of the State Medical Society:

Of all the many remedies of the U. S. Pharmacopœia there are two, which like Saul of Gibeah, are head and shoulders taller than their fellows: I refer to opium and chloroform. It is to the former of these two remedial giants that I wish to ask your attention.

Opium is the dried juice of the white poppy, *papaver somniferum* and its varieties, and is produced as an article of commerce in Asia Minor, Persia, East Indies, Egypt and China. It is produced to some extent in France, England and the U. S., though not to the extent of becoming an article of commerce. The drug as it is found in the shops, is in masses, of a reddish-brown or fawn color, and of an offensive, nauseating odor. The source of supply for the U. S. is Asia Minor, of which the principal port of export is Smyrna.

The poppy requires a rich soil for the profitable production of opium, and its time of sowing depends on the climatic conditions of the country. In Asia Minor the seeding is usually begun in November and continued at intervals for three months to guard against loss by insects, storms, etc., and for the purpose of preventing the maturity of the whole crop at once. The land having been thoroughly prepared by plowing and harrowing, the seed

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is broadcasted and dragged in, then the field is laid off into beds about ten feet in width, for ease in working and convenience in irrigating, after which the plants as they appear are properly thinned and weeded.

With the falling of the bloom the harvest appears. Within a few days after the petals fall, the immature capsules, then about 1½inches in diameter, are scarified by cutting about one-half way through the capsule. This is a process which demands considerable skill on the part of the grower, lest the incisions be made too deep and the juice be poured out on the inside of the capsule and thereby become lost.

The process of scarification is done in the afternoon, and the following forenoon the work of collecting the exuded juice commences. The operator with a dull knife or an iron spoon scrapes off the exuded juice and deposits it on a poppy leaf which is held in the palm of the hand. When a sufficient amount of the half-dried juice has been collected to form a ball weighing from a few ounces to two pounds, it is carefully wrapped in poppy leaves and dried in the shade. In this condition it is collected by buyers, who work it over and pack it in tins, holding from 1 to 150 pounds, in which it is exported.

Such opium as this is the finest that comes to this country and is known to the trade as "Turkey Opium." It is supposed to contain from 5 to 15 per cent. of morphia and our government requires that all opium admitted to this country shall conform to a standard strength of 10 per cent. morphia, determined by assaying a sample taken from an entire case which has been thoroughly powdered. In this way a fair idea of the value of a given lot of opium can be obtained.

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The most valuable constituent of the drug is morphia, which was discovered in 1816 by a German druggist named Serturner. This discovery was the first of a long list of discoveries of the vegetable alkaloids, and generally stimulated pharmacological research: The following are the most valuable of the sixteen alkaloids which are found in the crude drug, viz: morphine and codeine.

The value of the drug depends entirely on the amount of morphine which it contains, for the alkaloids except the above mentioned ones, are practically of no moment.

An important derivative of morphia is apomorphia, which is obtained by the action of hydrochloric acid on morphia in a closed tube, heat being applied, the resulting product being our most active and reliable emetic—a hypodermic injection of 1-12 grain producing thorough emesis in two to five minutes.

The most commonly used preparations of opium which are officinal are: Powdered Opium, Denarcotised Opium, Extract of Opium, Dover's Powder, Tr. Opium, Vinegar of Opium or Black Drops, Tr. Opium Camph , Deodorized Tr. Opium, Tully's Powder, Sulphate and Muriate of Morphine and Codeine. To these I will add Svapnia and McMunn's Elixir which are unofficinal but are very commonly in use by the profession.

Svapnia, to my mind, is the ideal opiate where it is to be administered by the mouth, it not being suited to hypodermic use.

Its use is unattended in most instances by those unpleasant after effects which characterize opium in other forms, while its pain relieving powers are unimpaired.

As regards chemical antagonism, the alkaline carbonates, lime water and the salts of iron, lead, copper, zinc

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and mercury, together with Fowler's solution of arsenic are incompatible with all preparations of opium, as are also vegetable astringents.

In case of opium poisoning, emetics are in order, the quickest of which is apomorphine, 1-10 gr. given subcutaneously. In the absence of anything better, mustard and tepid water, freely given, will usually have reasonably prompt and satisfactory effect.

The stomach pump has its uses in case the narcosis is due to the fluid preparations of the drug, though in my opinion, the value of the pump is theoretical rather than practical.

Further treatment consists of the exhibition of large draughts of strong coffee, hypodermics of potassium permanganate, forced exercise, cold bathing of the chest, the induction of severe pain by the application of thumb screws or similar devices, faradization of the chest muscles, together with subcutaneous injections of atropine 1-150 gr. given every twenty minutes, watching with great carefulness the state of the circulation and the condition of the pupils and the reflex movements.

Beware lest belladonna narcosis be substituted for opium poisoning by a too free exhibition of atropine. The injections should be limited to three in the case of the ordinary patient. Too great care cannot be exercised in the treatment of these cases. The hypnotic action of opium is greatly assisted by alcoholics; and its sudorific action by ipecacuanha.

PHYSIOLOGICAL ACTION.

All preparations of opium have a bitter, disagreeable and nauseating taste. They cause dryness of the mouth

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and throat, and a huskiness of the voice. If the drug does not nauseate, the appetite may remain unimpaired for a considerable length of time but eventually it is lost. The secretions of the glands of the body with the exception of those of the skin, are much diminished, and the peristaltic movements are greatly impaired. In consequence of the locked up condition of the secretions, hebetude and dullness of intellect, foul tongue, muddy skin and offensive breath, result.

If the administration of the drug be discontinued after prolonged dosing, a relaxed condition of the bowels succeeds the constipation and a profuse and foul smelling diarrhœa follows This condition of things is one that causes great inconvenience and distress, both to physician and patient, in the treatment of opium addiction. The heart's action becomes stronger and the tension of the arterial system is raised ; the face is flushed, the pupils of the eyes contract and the eyes become brighter. At this stage of the action of the drug the mind becomes more active and the ideas flow more freely, though not always with greater order. This stage of exhilaration or excitement, varies greatly in different individuals and is followed by a feeling of drowsiness, succeeded by sleep which is often accompanied by dreams and visions of a frightful character. Subsequent to the sleep are headache, vertigo, confusion of mind, muscular weakness and a sense of weariness and constipation. If full doses of the drug are administered, the stage of cardiac and cerebral excitement is much abridged and the stage of narcotic effect correspondingly prolonged and profoundly marked.

The confusion of mind, dizziness and drowsiness are succeeded by profound sleep, contracted pupils, slow pulse,

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slow and snoring breathing, itching of the nose, and possibly of the entire person, and a profuse perspiration. If the dose administered be lethal, the stage of narcosis quickly supervenes, the person falls into insensibility, with a slow and feeble pulse, slow and shallow respiration, often stertorous, the face becomes shrunken, cyanotic and pallid; pin hole pupils, wet skin, profound unconsciousness, great muscular relaxation, together with the abolition of reflex movements.

The diagnosis between opium and alcohol narcosis and uraemic coma is not always easy but it should be arrived at by a careful examination of the case and attention to its history.

The effects of the drug upon the brain induce a condition known as "wet brain," in which the subarachnoid spaces and the ventricles contain an abnormally large amount of serum, and the intracranial veins are engorged. The right auricle and the ventricle of the heart are distended with soft clots—perhaps due to the manner of death.

Owing to the slow and feeble respiration the blood is imperfectly oxygenated and the capillary circulation of the lungs becomes interfered with.

The action of morphia is practically that of opium with this difference,—morphine is less stimulating and more hypnotic and anodyne than opium and constipates less, but causes more itching and less sweating.

Circumstances greatly modify the action of opium, chief of which are age, individual idiosyncrasy, habitual use, sex and the presence or absence of pain.

Both extremes of life bear the drug badly. Death to the nursing infant has resulted from a medicinal dose exhibited to the mother; and a drop of laudanum has proved lethal to a child of less than six months of age.

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Old age demands relatively smaller dosage, as do women, who as a rule are more susceptible to the action of the drug than are men. Many persons are so violently affected by it that it should never be given in any dosage, its administration being attended by severe vomiting, vertigo, delirium, fainting and great prostration.

The habitual use of the drug diminishes the effect of its action in a remarkable degree. Thomas DeQuincy relates that at one time he habitually took 8000 drops of laudanum daily, equal to 320 grains of gum opium. A gradual increase in the dosage is necessary in order to maintain the physiological effect. The presence of great pain acts as an antidote to the effects of the drug, from which fact has arisen the idea of the use of some means to induce pain in the case of opium narcosis as one part of the treatment for that condition.

THERAPY.

In a general way, the prime indication for the use of opiates is the presence of pain in an unbearable degree ; yet this indication is hedged about with many limitations and each case must be judged by its individual peculiarities and symptoms.

I am sorry to make the admission, yet it is my honest opinion that the profession generally is not careful enough in prescribing this most potent of drugs—potent both for good and evil. The frequent cases of opium addiction indicate that somebody has injudiciously prescribed the seductive drug for a too long period of time or in an improper case, and the consequence has been most unfortunate.

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It has been my fortune to have some experience in the treatment of cases of drug addiction and I speak from experience when I say that out of every ten cases of addiction I believe some doctor was responsible for nine of them. I do not wish to censure anybody for such a result, but if such results occurred in any of our families, I doubt not we should not refrain from placing the blame where it very properly belonged.

The range of action of opium is so great that it may very properly be employed in a great variety of ailments; yet in all protracted cases we must bear in mind that in certain temperaments the danger of addiction is very great, and shield our patients accordingly, else we do them a very great wrong while meaning to do them only good. I can hardly find words strong enough with which to condemn the careless—nay criminal—prescribing of opium in chronic cases. Let us listen to the tale of one of these poor degraded slaves of the morphine habit and reflect. I need not speak further of the need of carefulness in the use of this most potent of drugs.

As a remedy for many forms of vomiting, opium stands without a peer—notably, those cases of hepatic, renal and lead colic, and severe cases of dysmenorrhœa, bad cases of seasickness and some cases of vomiting of pregnancy. The pains of gastralgia are best relieved by a subcutaneous injection of morphia, but it is worse than useless to attempt its *cure* by such a procedure often repeated.

In acute diarrhoea, the remedy finds a field of usefulness after the intestinal tract has received attention by the administration of a proper dose of rhubarb and soda, castor oil, or a saline.

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In dysentery, in the form of suppository or enema, it has often proven of use in controlling the pains, tenesmus and the frequency of the stools.

In cholera morbus, nothing can compare with a hypodermic of morphia. It is worth the whole of the other remdies of the Pharmacopœia as a means of combating this disease, stopping the pains, the watery stools, the cramps and the vomiting, like magic; and bringing about reaction and rescuing the patient from a state bordering on collapse.

In cholera infantum, I have often desired to try the same treatment, though I have never seen it recommended by any book on practice; yet, I firmly believe that it would have the same magical effect as in cholera morbus, if it were administered early in the course of the disease, and in a proper dosage.

Not having had a proper case for the experiment, I have refrained from making the test; but I have no doubt of the success of the treatment, if it is properly given, the "authorities" to the contrary, notwithstanding.

Bartholow lays down this maxim as a guide to its administration in gastro-intestinal maladies: "As a rule, opium does harm in all gastro-intestinal maladies in which there is a deficiency in the proper secretion, or a suspension of the functions, of the liver or kidneys." This saying of the great therapeutist should be remembered by us all as containing more than a grain of truth.

Before severe surgical operations, the hypodermic use of morphia has its appropriate place. It tends to strengthen the heart's action, to alleviate pain and to overcome shock; and in all severe operations it should not be omitted.

In the treatment of many inflammatory diseases, opium is one of our principal remedies and one upon which we place

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great reliance, combining with it, of course, appropriate local treatment. I refer to the treatment of pleuritis, peritonitis, appendicitis, etc.

In peritonitis, whether idiopathic, traumatic or puerperal, the *first* thing that should be done is the unloading of the bowels with a saline, large enough to leave no doubt as to its effect; this done, the bowels should be confined and kept so until the inflammatory action has subsided.

The quantity of opium given should be disregarded and attention given only to the pulse and the respiration, the drug being given to the extent of producing comparative freedom from pain even should it be necessary to go so far as to give enough to bring the respiration down to 10 or 12 to the minute, though in my experience it is seldom, or never, necessary to proceed to that extent.

Loomis speaks of having giving 4 grs. every two hours for twenty-four hours, but I cannot understand the necessity for such a dosage, if appropriate local treatment be employed as an auxiliary.

In appendicitis, I believe we should go slowly in our administration of opium, lest we mask the symptoms too much and thereby defeat our object.

In pneumonia, I shall take the ground that opium should *never* (almost never) be used.

I am aware that many most excellent physicians consider my views erroneous, and prescribe it from beginning to finish; but so far as my observation goes, those doctors who use it in this disease are the ones whose mortality record is one of which they can not speak with pride.

Prof. Loomis advised to begin the treatment of this disease with a sub cutaneous injection of morphia sufficiently large to put the patient at ease, claiming that

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thereby you put the patient in the best possible condition to withstand this serious illness. I believe Dr. Loomis was mistaken in his premises and deductions, and that instead of being the *best* thing, it was the *worst* thing that could be advised ; at any rate Dr. Loomis was called upon to test in his own person the correctness of his own theories and treatment, and he like the majority treated with opiates failed to come back to life and health to tell us how nicely it relieved the pain, but how terribly it locked up the secretions, stopped the cough, checked the expectoration, increased the difficult breathing, intensified the sufferings and how it bound them hand and foot and delivered them over to the Grim Reaper.

I firmly believe that the use of opium in pneumonia and capillary bronchitis is one of the grossest abuses of one of the greatest of remedies, and to this fact I respectfully ask your attention. I believe it is the direct cause of more mortality in these two diseases than any other one cause. In pleuritis these remarks do not apply.

In typhoid fever the drug has its uses in controlling the diarrhœa, when too profuse, in relieving the pain and quieting the restlessness of the patient, thereby inducing sleep ; yet its use should be limited.

In meningitis its use is contra-indicated, owing to its tendency to cause increased congestion of the meninges and brain.

In acute mania and delirium tremens it should be used cautiously, preference being given to Bromides and chloral hydrate.

In tic-douloureux, sciatica, pelvic neuralgia, cardialgia and neuralgias generally, the use of the drug is to be condemned, except it be occasionally, as the danger of

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addiction is great in this class of cases. The seductive powers of morphia, when given hypodermically, are too great to be resisted by many patients unless the physician is discreet and shields them from its evil influence.

In diabetes mellitus, codeine exercises an almost incredible power, checking the inordinate appetite, allaying the distressing thirst, lessening the secretion of urine, reducing the amount of sugar and arresting the changes in the nervous system, seeming to exert a really curative action.

In obstetric practice it is often of the greatest value, being used with great advantage in the first stage of many cases of labor, and in abortion.

In puerperal eclampsia hypodermics of morphine act quickly in controlling the convulsions, and give time for other measures to be employed.

The abuses of opium consist largely in the indiscriminate prescribing of it for all sorts of aches and pains, in chronic pelvic and nervous ailments; in the prescribing of "cough syrups;" in its administration in obstetric practice for the purpose of relieving "after-pains;" in the acute chest and nervous troubles of infancy and childhood; and in the too common use of it in so-called "soothing-syrups," paregoric and other vile mixtures which are made use of by lazy and ignorant mothers and nurses who care more for their own ease and comfort than for the good of their little ones.

We, as a profession, should not fail to enlighten the people among whom we go in our daily round of duties regarding the baneful effect of such mixtures upon the health of their little ones and by so doing we shall in some measure atone for the mistakes made by some of the more care-

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less of the profession in the too prolonged and injudicious administration of the drug.

Thanking you for your attention, I leave the subject for further discussion.

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My First Twelve Years' Obstetric Practice.

By J. Sutcliffe Hill, M. D., Bellows Falls, Vt.

In presenting a paper on the above subject I do so from the fact that I believe we can accomplish the most good by bringing up for discussion the practical questions of every-day life instead of the abstract questions and theories that lend interest only from their scientific value. All will admit I am sure, that the first few years of a practitioner's life are ones of great anxiety and solicitude, especially when called to his first case of obstetrics.

When we consider the many complications which are liable to occur, either ante-partal, partal, or post-partal, it behooves us to approach these cases with clean hands and a clear conception of the responsibility that is placed upon us.

In the whole range of medical practice there is nothing that so tends to bring out the qualities of the man in regard to the duties of the profession as the practice of obstetrics.

As physicians we are so often brought in contact with pathological conditions where either medical or surgical inteference is a necessity and a duty, that in a physiological condition we are apt to look upon it in a pathological sense and many times by our misguided efforts change the physiological into a pathological condition. This is possible

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by allowing sympathy to supercede judgment, a desire on the part of the attendant to finish the case by the use of the forceps on account of time, and a neglect of the necessary precaution in regard to cleanliness on his part and that of his assistants.

My desire is to give a resumé of my own experience in this branch of our profession as it has occurred during my first 12 years, pointing out my shortcomings during this period, as it is only by a realization of these facts that we can expect to become better practicioners. Labor *per-se* is a physiological condition in which our duty is to watch, not with blindness born of ignorance, but with an intelligence attained through knowledge, that we may if possible be the means of bringing to a successful termination the delivery of the mother.

In being called to attend a case of labor the physician should be prepared as far as possible for all the various contingencies which may arise. In looking over well known text books on this subject, in regard to the various articles the physician should carry, I find the omission of what I consider of as much importance, or more than all the rest mentioned, namely :—the articles for the preparation of the physician himself. I have no doubt that some of the later works on this subject have given it some attention but I know from actual experience in every-day practice that these instructions are not carried out, and until they are, no opportunity should be neglected to present them. It is only during the last few years that I have carried them out fully myself. My custom is to carry with me one of my clean surgical frocks—of which I keep a number—which I wear until the completion of the labor. I wash my hands and arms with warm water and soap and

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then with my brush, which I keep for this purpose, scrub them thoroughly in a hot solution of bichloride of mercury, paying particular attention to the cleaning of my finger nails. I then make the examination and rewash in another hot solution of bichloride which I prepare and keep for my own use in the sick room, never making an examina- throughout the labor without these precautions. At its completion I give instructions to the nurse in regard to after-care of the patient, always having her use a solution of carbolic acid at every washing and never resorting to the douche. This last procedure I should most certainly advise if there should be an elevation of temperature.

About 11 years ago I was unfortunate in meeting with my first case of puerperal septicæmia, and this in a family where everything was as favorable for the successful termination of the labor as it seemed possible to make it. The surroundings and nursing were all that money could provide. Then why did this occur? I was not in attendance at the time, on any case that we look upon as liable to produce this disease. This septic infection was produced, I believe, from the fact that I was not clean, although I had washed my hands in the ordinary manner with warm water and soap, but not in solution of bichloride such as I use at the present time. She eventually recovered after a lingering sickness and I am thankful to state I have never had a case in my own practice since that time. The primal lesson for us to learn in our attendance upon these cases, with the evidence that has been furnished since the revolution in surgical methods of cleanliness, is obstetric cleanliness.

The second consideration is of such a trivial character that it ought not to be necessary to mention it in this con-

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nection, were it not an established fact. How many times have the forceps been applied when the labor would have terminated naturally if the physician had only waited a sufficient length of time? It has been said to me many times "I could not wait, I applied the forceps and finished the case." This has been resorted to when the patient has been suffering from nervous excitement and not from actual pain, such as is expected in these cases. Do not from this sentence misunderstand me. I believe fully in relieving pain, as much as anyone, but I do not believe in subjecting a patient to surgical interference that is unnecessary and uncalled for. The forceps are of inestimable value in the hands of an obstetric physician, but we should never lose sight of the fact that means for great good may also be the means of unbounded evil, and the forceps applied unecessarily, even if we are fortunate in avoiding a rupture of the perineum, is an evil that should under all circumstances be condemned.

In this connection I may mention a small matter that has come under my observation, and yet it may have something to do with with the use of the forceps. Many times I have noticed that the anterior lip of the os becomes caught between the head of the child and the pubic bone of the mother. Every pain that the patient has after it is once caught only increases the obstruction as the lip will then swell enormously and prevent in great measure the delivery of the child. I have one patient that I have attended in confinement three times, twice without, and once with forceps after a neglect of this precaution.

My custom is to keep watch of the anterior lip and at the time it begins to swell to press it back with my fingers and hold it during the pain. It causes no inconvenience

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to the patient and I feel sure it has saved me the use of the forceps in many cases.

Another common source of annoyance, if not sometimes obstruction, is an over-loaded rectum. No matter whether the patient has had a stool or not, I believe it is good practice, if time will allow, for the nurse to give the patient a hot water enema, as it not only removes the feces, but has a tendency to relax the parts, increase the pains, and although it seems paradoxical, affords relief to the patient. The instructions given for the preservation of the perineum are of inestimable value and should be most carefully attended to, but my experience has been that many perinenei are torn after a safe delivery of the head and at the delivery of the shoulders. This has occurred with me and I cannot but think that is possible in the practice of others. It has taught me the lesson to be just as careful at the delivery of the shoulders in preventing rupture of the perineum as I would be at the time the head was born. What should be done if the perenium is torn? The parts should be made as clean as possible by washing in a solution of bichloride, and if we are prepared to take charge of a case of labor as we should be, we then are in a position to attend to it at once, the needles and sutures are boiled and prepared in the same manner as for any other surgical operation, and the perineum repaired, taking time to carefully co-apt the parts and bring them in perfect apposition. After suturing, dust with iodoform and apply bichloride gauze instead of the common and sometimes unclean napkins so often used for this purpose.

It would be a marked gain and one in the right direction, if the physician would advise the families to purchase from their druggist the plain gauze and then instruct them

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in the manner of sterilization by baking, as all families, no matter how poor, have the necessary instruments for this purpose. The attendant may take all the care possible in doing his work, and an incompetent nurse may very readily, by using unclean methods, destroy it all, and the sterilized gauze would be another step in the right direction.

During this period it has been my misfortune to meet with two cases of placenta prævia; in one, by passing my hand through the placenta and performing version as rapidly as possible, the mother and child were both saved. In the other the mother and child both died. The last was a most interesting patient. She was short of stature, with a decided rachitic tendency. She had been under treatment by various physicians for chronic Bright's disease and had been an inmate of the Massachusetts General Hospital for this same disease. At a previous labor I had found on examination an antero-posterior contraction of the pelvis, and after careful consideration with counsel, we decided to perform craniotomoy. This is the only case in which I have ever resorted to this operation, and although she made a good recovery, I hope it may be the last, as I believe with our present knowledge other methods can be resorted to. About one year later I was again called to attend this patient in labor and found her pulseless and flowing enormously with a complete placenta prævia. Council was immediately called, but she died in a very short time. This is the only fatality in the 12 years that I have to record.

During this period I have had two cases of puerperal eclampsia, so that my experience in this complication has been very limited and insufficient to give a practical opin-

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ion, and yet as both of these cases recovered I feel justified in giving you the method of treatment. Both patients had suffered, without paying heed to their condition, from swelling of the feet and ankles, and after making a hasty examination of the urine found albumen in large quantity. There was a flushed face, bounding pulse and a general restless condition which soon passed into convulsions. The usual treatment by bromides and chloral were both faithfully resorted to and given by mouth and rectum, but with little or no avail. Chloroform allayed them temporaily, but I did not feel at all safe with the patient in this condition. She was allowed to come out from the effect and the lancet was brought into use, which gave almost instant relief from the convulsions and allowed time for the dilatation of the os, the application of the forceps and the delivery of the child. The treatment is not new, I am well aware, and in certain quarters is condemned, but having been successful in these two cases that have come under my observation, I shall certainly be tempted to resort to the same method of treatment in the future.

Version I have performed only some six or eight times —once for placenta prævia, twice for contraction of the pelvis and the rest for different forms of mal-position of the child. I have seen one case of complete inversion of the womb (in consultation) but the patient soon passed into collapse and died in about 30 minutes.

In making as I have a hasty review of the cases that have come under my immediate care, I trust it may be the means of bringing out for discussion some of the salient points in obstetric practice, and tend to emphasize some of the dangers which concern both mother and child. It is a momentous period in a woman's life and justice demands

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that we should give her at that time the best that our knowledge affords, so that she can better perform the duties of motherhood.

There are many points that I have not mentioned in this connection as I am of the opinion that with perfect cleanliness and sound physiological judgment the vast majority of these cases will stay where they belong and not pass into a secondary classification.

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Obstetrics.

By F. R. Stoddard, M. D., Shelburne.

This is a subject that is of more or less interest to all general practitioners, especially the country doctor, who must be physician, surgeon and obstetrician.

In this short paper, I will report some of the gleanings of fourteen years' obstetrical work in a small country town. In the fourteen years I have confined three hundred women, and there have been three hundred and four children born. Of the presentations, of the left occipito-anterior, two hundred and forty-five right occipito-anterior, forty-six; breech, eight; face, two; foot, three. Of these three hundred, one hundred were first confinements.

Sex. There were one hundred and forty-two boys and one hundred and sixty-two girls. The largest living boy weighed fifteen pounds, the smallest four pounds. The average weight of the boys was seven and one-half pounds. The largest girl weighed eleven and one-half pounds, the smallest living girl three and one-half pounds. The average weight of the girls was seven pounds. The only malformations were one spina-bifida and one hydrocephalus. The child with spina-bifida was a girl which weighed seven pounds and was a normal child in all respects, but on the back in the lumbar region, there was a tumor, soft and covered with a reddish skin and membrane. The tumor was

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about the size of an English walnut when the child was born, but in a few days began to grow and attained the size of one's fist at the end of three weeks, when the child died. The child had no use of her legs and I think there was loss of two or more of the bones in the spinal-column in the lumbar region.

The parents were very ignorant and superstitious and there was no treatment attempted or post mortem made, and I am not able to learn that any treatment of the disease is of much avail. The hydrocephalus baby was born September 2, 1896, and well do I remember the day. The mother was a primipara French Canadian, short and exceedingly fat. She was taken in labor on Sunday but the pains were not very severe till I was called on Tuesday morning at 9 o'clock. The woman had pains about every fifteen minutes. On examination I could not reach the os per vagina but by examining the abdomen, I saw the woman had a very large flabby belly with a large child, and I thought the head was presenting but could not be certain on account of the excess of fat. I called at noon, the pains were about the same in frequency, but I was still unable to reach the os. The same condition was present at six P. M. in regard to pain and inability to reach the os. At ten P. M. I was called again and was just able to reach the os which was quite rigid and would just admit the end of my index finger. I gave her a hypodermic of ¼ gr. morphia, and went home, with instructions to call me if needed before morning. At three A. M. Wednesday I was called and found the pains about the same as at ten P. M. The hypodermic had given the woman about two hours rest. The os was dilated a little more and I gave another hypodermic of ¼ gr. morph. and returned home. At nine A. M.

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I found the os dilated to about the size of a twenty-five cent piece, pains quite regular about ten minutes apart. At 12 M. there was a little more dilation, the os about the size of a fifty cent piece, pain every five minutes and very severe with bearing down.

Pains continued hard and regular all the afternoon. At 4 P. M. the woman began to show signs of exhaustion, having been in labor sixty-four hours, and as the os was somewhat larger than a silver dollar, I gave her chloroform and applied my forceps to the head while it was still in the uterus.

The forceps were applied without much difficulty or any injury to the woman, and traction was made during each pain. The forceps would not stay on the head at all but would slip off and I could not bring the head down at all. So I thoroughly chloroformed her, and introduced my hand into the vagina and tried to turn the child by bi-polar method, working during cessation of the pains. In a short time my right hand was numb and I changed and used the left with the right on the abdomen. After a time I succeeded in getting one leg and then both, and soon had the body delivered, and without much trouble delivered the head which was about thrice the size of an ordinary baby's head.

The baby was still-born and weighed thirteen pounds. The head was filled with a watery fluid and the bones were all loose. The woman made a good recovery.

Puerperal-eclampsia has occurred only twice; both were primipara women and each was thirty-six years old, one a slender woman, the other stout. The first occurred nineteen hours after confinement. The labor was not very hard and instruments were not required. The child, a male,

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was still-born, showing signs of having been dead several days. This excited the mother and made her very nervous as she had looked forward to the birth of her first child with a great deal of anticipation. But there was nothing unusual about the case until nineteen hours after confinement when she had a terrific convulsion, followed by several others. I reached the house about an hour after the first convulsion and she had three after I got there. I began the use of ether and bromide soda, gr. ten, and chloral, gr. five, every fifteen minutes. There were only three more convulsions, but the woman was in an unconscious state for twenty-four hours. The urine was normal before and after confinement. She made an uninterrupted recovery and has since borne a healthy girl baby without any convulsions.

Case second occurred in October, 1895.

Mrs. C., American, age thirty-six, married, first pregnancy. Was very well up to two weeks before confinement, no headache or albumen in the urine as I examined it several times. October 27th, there was some oedema of the feet and limbs. The urine passed that day contained quite a quantity of albumen. I ordered her to take one tablespoonful of cream of tartar and Rochelle salts dissolved in a glass of water, to take a teaspoonful every hour until bowels were freely moved. October 29th, Mr. C. came to my office at 8 A. M., said his wife was not so well, some headache. I drove right down, it being five miles away, reached there about 9.

I found the woman unconscious and that she had had one severe convulsion about half past eight. At 9 o'clock there was another convulsion. I endeavored to bleed her, but could get only one or two drops of blood. I then gave her thirty gr. of bromide soda and fifteen grs. chloral and

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hypodermic of morphia one-quarter gr. At 9.30 A. M., there was another convulsion and one at 10 A. M., so severe that respiration stopped and I used artificial respiration for some time before she breathed. At 10.20 she had the fifth and most severe one of all.

The os was not enlarged at all and no signs of labor, and I sent for council and began to dilate the os with my fingers, and sent back five miles for chloroform, ether and forceps. At 11 A. M., there was another convulsion and the last, making six in all. The messenger having returned with the ether and forceps, I began the use of ether and continued the forcible dilatation of the os, using my right hand until it was tired out, then my left. Shortly after 1 o'clock I had the os dilated enough so I applied the forceps and began traction, but without bringing the head down very much. At 2 P. M., Dr. B. arrived and took a hand at the forceps, alternating with me until till half past three and had only brought the head down a little as the presentation was occiput-posterior; we then decided to turn and deliver the child in that manner. I introduced my hand into the vagina and pushed the head up and with the other on the abdomen succeeded in a short time in getting hold of the feet and delivering the child all but the head. The forceps were applied and the head delivered. The child was worked over and artificial respiration used for nearly an hour before it breathed, but after that he was all right, weighed ten pounds and is to-day a fine fellow. The mother remained in an unconscious condition till 7 P. M. when she revived and began to talk. I used the catheter and drew off a pint of dark urine with some blood. It contained a large quantity of albumen. The woman rested well during the night and never had any headache. The albumen soon diminished and at the end of

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five days was clear. The bowels were kept loose with Seidlitz powders, and sugar of milk gr. sixty well diluted was given as a diuretic. Everything seemed to be going on well five days after delivery with both mother and child, with no albumen and all right apparently, but on Monday, the seventh day, there was some albumen.

I went to New York the next day and left her in care of my brother. He reported that Mrs. C. had quite a quantity of albumen in her urine but was passing forty-eight oz. a day of water with specific gavity of 1016 and taking good quantity of nourishment and had no rise of temperature. He had the urine examined by microscope and found all kinds of casts denoting a severe type of chronic disease of the kidneys but there was no symptom aside from the urine, as the patient ate and slept well and nursed the baby, but was quite weak and lost some flesh. She was kept on a milk diet and given sugar of milk and tonics but she died one night seventeen days after the birth of the child. She had been asleep and awoke and told the nurse she felt real well, took some nourishment and turned over to go to sleep. The nurse started to go from the room and she heard a sort of gasp, went to the bed and found the woman was dead. There was no autopsy.

Puerperal fever had occurred three times. The first case was a Mrs. K., age twenty, easy labor, and very short for first one. Placenta delivered in usual manner, and all went well up to the seventh day when there was a chill and rise in temperature. I was called the next day, found the woman with a temperature of 104°, pulse 120, scanty lochia, with bad odor. Gave two gr. quinia, a vaginial douche of hot water with carbolic acid, 1-60, every four hours. Next day temperature 104, pulse 125. I gave an intra-uterine douche of hot

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carbolic acid solution 1-60 and curetted the uterus, getting away small blood clots and several pieces of adherent placenta. After curetting there was a small piece of iodoform gauze placed in the os and removed the next day. The day after curetting the temperature was normal, pulse 80, and the convalescence was uneventful.

Case two, Mrs. D., aged thirty-seven, delivered of her eighth child, normal labor, child healthy. Ten days after confinement, was called and found her with a temperatureof 102½, pulse 100, some tenderness, scanty, foul-smelling lochia.

Ordered a hot carbolic acid solution 1-60 douche for vagina and gave her fifteen drops fl. ext. ergot, and 2 gr. quinine every four hours. The next day the condition was unchanged, I gave her the intra-uterine douche and curretted the uterus and washed it out with the carbolic solution. I got only some small pieces of decaying placenta and blood clot. She made a slow recovery although there was a normal temperature in a few days.

Case three. Mrs. L. aged thirty-nine, seventh labor, long and hard, lasting three days and ending with ether and forceps and the peeling off of the placenta. All went well for six days, and then a rise of temperature 102½, and soreness of abdomen, scanty discharge of lochia. Vaginal douche relieved the trouble somewhat but still the temperature was high so I gave her the intra-uterine douche and curreted the uterus,washed it out, and the woman made a good recovery. I have since that time confined all three of those women and not had a particle of trouble.

When my patients have any rise of temperature I advise the use of the hot carbolic acid solution, 1-60, once in four hours but with all normal labor only once or twice a day. I

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allow my women to sit on a chamber to pass urine, and in that way clots and particles of placenta are dislodged from the vagina, and do not remain there to be absorbed, as they would if she was obliged to lie flat on her back and pass water in a bed-pan, which I think for the ordinary lying-in woman is a source of danger.

Placenta praevia has only occurred once in the three hundred cases, and I hope will never happen again during my obstetrical practice. Mrs. B. aged thirty-three, third pregnancy. At the seventh month she had quite a severe hemorrhage and I thought it was a case of placenta praevia, but rest in bed and small doses of morphine soon relieved the case.

I told the woman what I thought of the case and directed her to call me as soon as possible if there was any more bleeding. One month later I was called early one morning by the husband. He said, "hurry doctor, my wife is bleeding to death." When I reached there the woman's face and the pillow were the same color. On examination I felt the placenta adhering to the left side, and as time was precious, the bed being a pool of blood, and the blood running off on the floor, I pushed my right hand into the uterus as the os was fully dilated, and soon pushed the head out of the way and got hold of the feet and had the breech into the os and the child delivered in one or two pains. Stimulants were freely given, the placenta delivered and the woman made a good recovery.

Phlegmasia dolens. I have only one case of this complication to a normal delivery to report. Mrs. M., aged forty, tenth pregnancy, long, hard labor with a posterior presentation. I was assisted by Dr. B. We fully etherized the woman, and delivered with the forceps after two hours hard

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work. Male child, alive, and weighed thirteen pounds. Mother very much exhausted, but soon rallied, and did well up to the third day when she had some rise of temperature, and pain in the left leg below the knee, and also swelling. I diagnosed phlegmasia dolens and ordered hot formentations to the leg, absolute quiet, and anodynes to relieve pain, and quinine for high temperature, 103°.

The next day the temperature was the same, leg more swollen and painful, patient restless and uneasy, lochia normal; increased the anodyne and continued other remedies with cloths wrung out of hot water with laudanum applied to the leg. The next morning there was no improvement in the limb. Temperature, 103; pulse, 120; restless, wanted to sit up. Treatment continued, with a firm bandage about the leg. During the night the woman sat up in bed and died very suddenly. The son came for me and I went immediately to the honse but found her dead. The attendant said she left her for a moment to get some wood and when she came back she was sitting up and gasping and lived only a few minutes. There was no autopsy. I think death was caused by a dislodgement of some of the clots which were carried into the circulation.

I have one case of post-partum hemorrhage to report. Mrs. H., aged thirty-two, sixth confinement, a small, rather delicate woman.

I delivered her of twins, boy and girl; boy weighing eight pounds, was born first. In about an hour the girl was born. The mother appeared to stand the ordeal well, placenta came away very readily. I was about to apply the band, and turned her from her left side to her back, and as I did so noticed an extreme pallor and a sigh. I examined her at once and found the bed full of blood, and

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the uterus very large. I compressed it down, and had the nurse inject ergot and brandy, and in a remarkably short time the blood stopped flowing. I held onto the uterus an hour and then the womb regained its wonted tone, so there was no more hemorrhage. The mother did well and made a good recovery, although it was slow.

In the management of the second stage of labor, after the head has presented for any length of time, say from thirty minutes to an hour, with no apparent progress, I give chloroform and apply the forceps, and make traction at each pain and give a small quantity of chloroform at the beginning of each pain. I ask the patient to tell me when she feels the pain coming and I give the anesthetic with instructions to take several deep breaths, and in this way it very naturally lessens the severity of the pain. I remove the forceps as soon as the head engages under the public bone and allow nature to finish the labor. I give the chloroform in all my labors in the last stage before the birth of the head, and I know that it saves the strength of the mother, and does not injure the child or tend to post-partum hemorrhage. I know I give an anesthetic now oftener than ten years ago and I know it is appreciated by my patrons.

Of late years I have not given ergot at all. I was taught to give a dose of ergot as soon as the child was born, but I failed to see it was of any use, and might produce harm, as I thought it did in one case where I had hour-glass contraction of the womb before I got the placenta, and had to forcibly dilate the contraction and peel off the placenta, and it was a difficult piece of labor.

I am not certain that it was caused by the ergot but I thought it was, and since then I have used it only in cases

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of post-partum hemorrhage, after the delivery of the placenta. I always deliver the placenta before I leave the bedside of the woman. After the child is delivered, the cord tied and cut, and the child given to the attendant, I place my hand on the abdomen to ascertain the size and contractility of the womb. I hold on to the uterus and as soon as there is any pain I squeeze it to press the placenta out and if I cannot deliver it in this way inside of thirty minutes, I begin to investigate as to the cause, and give chloroform and introduce my hand into the womb and if necessary peel the placenta off, and deliver in that manner, and I never feel that I have done my duty, until the placenta is in the slop jar. As to the use of the band for the woman, I use it for a few days in most cases, but I do not consider it of much use in most cases except for a few hours to support the abdomen.

My forceps and hands I endeavor to have perfectly clean and then I go ahead and do whatever is necessary, use the forceps or turn as necessity requires. I always intend to have in my bag a pair of forceps and catgut, chloroform or ether or both, and a hypodermic syringe, a finger brush, and carbolized vaseline, and be always ready to encourage and help the suffering mother.

The object of this short history of cases, is to excite the other members of the society to report their cases and to encourage discussion.

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The Discovery of Ether.

By W. J. Aldrich, M. D., St. Johnsbury.

Just 40 years ago to-day in the city of Boston, there was enacted a drama that not only startled the medical profession, but aroused the world. It was the proving of the power of Ether over pain—the production of anæsthesia for surgical operations.

To prevent or diminish pain in surgical operations is an object so desirable that from time immemorial efforts have been made to attain it. Homer mentions the anæsthetic properties of Nepenthe; Herodotus refers to the practice of the Scythians of inhaling the vapor of a certain kind of hemp to produce intoxication. The employment of mandragora to produce anaesthesia is alluded to by Pliny. It also appears from an old Chinese manuscript that a physician named Hoatho, who lived in the third century, gave his patients a preparation of hemp, whereby they were rendered insensible during the performance of surgical operations. The soporific properties of mandrake are alluded to by Shakespeare, who makes frequent mention of anaesthetising draughts. It appears that Augustus, King of Poland, underwent an amputation while rendered insensible by a narcotic.

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But the practice of anæsthesia had never become general, and physicians in all ages appear to have regarded it with disfavor.

Coming down to more modern times, in 1800, Sir Humphrey Davy, while experimenting on nitrous oxide gas, discovered its anæsthetic properties, and suggested that it might be employed in surgery. His suggestion, however, remained unheeded for nearly half a century until Dr. Horace Wells, a dentist of Hartford, Conn., in 1844, underwent in his own person the operation of tooth extraction while rendered insensible by nitrous oxide gas. After further experiment he became satisfied that teeth could be extracted under its influence without pain, and he undertook to establish a practice of painless dentistry in Boston, but on account of the unfortunate failure of an experiment the project was abandoned.

The first record we have of the inhalation of the vapor of sulphuric ether was that of Dr. Pearson of Birmingham, Eng., who used it for the relief of asthma and other lung affections. In 1805, Dr. Warren, of Boston, used it in the same manner for relief in the later stages of consumption. In 1818, Faraday, while experimenting with ether discovered that it possessed anæsthetic properties similar to those of introus oxide gas, and this same property was demonstrated by several American physicians about the same time.

To us, looking back upon the experiments and observations of these early investigators, it seems marvelous that the wonderful utility of their discoveries was not immediately recognized and turned to practical use, but they appear to have been regarded in the light of mere scientific curiosities, or subjects fit only for lecture room experi-

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ment, rather than as facts capable of being applied to the treatment of disease, and it remained for Dr. William T. G. Morton, a dentist of Boston, to demonstrate the usefulness of ether and give to suffering humanity the greatest boon in the world's history.

The story of Dr. Morton's early experiments and the final proving of his discovery, is told by his widow in a recent article, and I am indebted to that narrative for many facts here mentioned.

Dr. Morton was one of those tremendously earnest men who believe they have a high destiny to fill, and he would often say to his wife that he had a great work to do in the world. For a long time prior to his discovery his spare time was spent in experiments on bugs and other insects, and even his faithful dog, but a time came when he wanted a human subject, and his assistants were sent out offering a reward to any person willing to have a tooth extracted while under the influence of ether, but no one could be found who was willing to assume the risk. Unable to to find a patient, he shut himself in the office and tested it upon his own person, with such success that he lay unconscious for several minutes.

So great was his joy at this success that he was determined not to sleep until he had repeated the experiment. Here Fortune seemed to favor him, for he had barely reached his office when there entered a man with his face all bandaged and evidently suffering acute pain, asking to have the offending molar pulled and inquiring if the Docter couldn't mesmerise him while it was done. The Doctor could have shouted for joy, but, retaining his self-possession, he explained the inhalation of ether and assured the sufferer that it was better than mesmerism. To make

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a long story short, the man was anæsthetised and the tooth extracted with perfect success.

From that moment Dr. Morton felt that the success of ether was assured, and thenceforward he was untiring in his efforts to bring his discovery to the attention of the Medical profession. After many discouragements he at last succeeded in inducing Dr. Warren, senior surgeon in the Massachusetts General Hospital, to allow him to try his discovery on a patient who was about to undergo an operation.

Dr. Robert Davis, now living at Fall River, was then a medical student, and witnessed the operation, and it is to him that we are indebted for a description of what transpired on that memorable occasion.

The amphitheatre was crowded with physicians and students, all curious, all skeptical as to the success of the operation. All of the eminent surgeons of Boston were present, including the celebrated Dr. Jacob Bigelow. The hour for the operation arrived and Dr. Morton, who was detained at the instrument maker's with his inhaler, was not on hand. Five minutes past—ten minutes, and then Dr. Warren, the eminent surgeon, looking around with a sarcastic smile upon his face, suggested that as Dr. Morton was not present, the operation had better go on in the usual way.

At that moment Dr. Morton came hurrying in, and with a coolness and self-possession in strong contrast to the nervous assembly, he proceeded to administer the vapor of sulphuric ether to a human being to produce anæthesia for a surgical operation for the first time in the history of the world. As soon as anæsthesia was complete he turned

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to Dr. Warren and calmly said, "Doctor, your patient is ready."

In all parts of the great amphitheatre there came a quick catching of the breath, followed by a silence almost like death as Dr. Warren stepped forward and prepared to operate. The sheet was thrown back, exposing that part of the body from which a tumor was to be removed, an operation exceedingly painful under ordinary conditions, but neither very difficult nor very dangerous. The patient lay silent with eyes closed as if asleep, but every one present fully expected to hear a shriek of agony ring out as the keen knife descended into the sensitive nerves. But the stroke came with no accompanying cry, and then another and another, while the severed arteries spurted forth their crimson blood. The tumor was removed, the wound closed with sutures, bandages applied, and the operation was done, and through it all no sign of consciousness or pain was exhibited by the patient. In a few minutes he revived from the ether, and Dr. Warren asked if he felt any pain, to which he replied that he did not. Then turning to the assembly Dr. Warren, in his impressive manner, said, "Gentlemen, this is no humbug."

The paths of a discoverer lead but to disappointment and chagrin, and such proved to be the case with Dr. Morton. There sprang up around him those who claimed priority of discovery, and one Dr. Jackson declared the whole idea was borrowed from him. Be that as it may, the fact remains that ether anæsthesia was never applied in surgery and never received the attention of the medical profession until its utility was so ably demonstrated by Dr. Morton.

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In view of the greatness of the discovery and its world wide application, it would seem but just that the government of his own country should make some recognition of so eminent a service, but in spite of the efforts that were made during subsequent years, nothing was ever done. This was perhaps the greatest sorrow of Dr. Morton's declining years, a sorrow rendered all the more keen by the fact that other governments hastened to bestow upon him orders and decorations. Russia gave him the cross of the Order of St. Vladimir; Norway and Sweden gave him the cross of the Order of Vasa; and the French Academy of Arts and Sciences gave him a gold medal. But the thing he prized most was a small silver casket from the Massachusetts General Hospital containing one thousand dollars. These are all he received, except the everlasting gratitude, not only of his fellow-countrymen but of suffering humanity everywhere.

Dr. Morton died in his 84th year and was buried in Mount Auburn cemetery near Boston, in the presence of many noted physicians. Over his grave stands a monument erected by the citizens of Boston, bearing this inscription, written by the late Dr. Jacob Bigelow:

"Dr. William T. G. Morton, inventor and revealer of anæsthetic inhalation. By whom pain in surgery was averted and annulled. Before whom in all time surgery was agony. Since whom science has control of pain."

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The Value of Cimicifuga Racemosa in Pregnancy and Labor.

By F. C. Kinney, M. D., Greensboro.

I do not remember, as a medical student, ever having my attention called, either by lecture or in text book, to any special value of black cohosh in obstetric practice, but the "Medical Record" of August 29th, 1885, contained an extract of a paper read before the "Chicago Gynecological Society," by Dr. J. S. Knox, which I read with great interest.

The more so, perhaps, as but a day or two after I read this article, I had been consulted by a gentleman, whose wife was then six months pregnant, who, in two previous confinements, had long, difficult labors, resulting in forceps delivery and bad lacerations.

This gentleman asked me if there was "nothing to be given to make child bearing easier" for his wife. I counseled him about her dress, diet, habits, regulation of bowels and kidneys and asked him to call next day when I would have something ready for him. I again read the article referred to, and decided to give the cimicifuga a trial in this particular case. I accordingly made this mixture :

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R. F. E. Cimicifuga Racemosa, oz,i.
Comp. Syr. Sarsaparilla, oz,iii.
M. Sig. Teaspoonful at night on retiring.

This experiment, for it was neither more or less, was tried to relieve the patient's mind for she "knew she would have just such another time" as she had before.

Her first labor resulted in death of child and a bad laceration. Her second child survived the ordeal, but her perineum was again ruptured. This prescription was taken faithfully during the last three months of her third pregnancy.

Let me now introduce the conclusions arrived at by Dr. Knox, from his clinical observations of a large number of cases treated with the cohosh.

"1st. Cimicifuga has a positive sedative effect upon the parturient woman, quieting reflex irritability. Nausea, pruritis and insomnia, so common in the last six weeks of pregnancy are always rendered less distressing, and often disappear under its administration."

"2d. Cimicifuga has a positive anti-spasmodic effect upon the parturient woman. The neuralgic cramps and irregular pains of the first stage of labor are ameliorated and often altogether abolished. In fact during the first indiscriminate use of the drug in all cases, says Dr. Knox, I had the mortification with a few women of terminating the labor so precipitately and without prodromic symptoms as to be unable to reach the bedside before the birth."

"3d. Cimicifuga relaxes uterine muscular fiber and the soft parts of the parturient canal, by controlling muscular irritability, thus facilitating labor and diminishing the risk of laceration."

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"4th. Cimicifuga increases the energy and rhythm of the pains in the second stage of labor."

"5th. It is my belief that cimicifuga, like ergot, maintains a better contraction of the uterus after delivery. It is my habit, however, to administer from fifteen to thirty minims of the fl. ext. of ergot after the birth of the foetal head and I have had but few opportunities of testing this effect of the cohosh."

Continuing, Dr. Knox says, "My method has been to give fifteen minims of the fluid extract of Cimicifuga in compound syrup of sarsaparilla each night for four weeks before the expected confinement."

One fluid ounce of the fl. ext. of cimicifuga to three fluid ounces of compound syrup of sarsaparilla, dose, one teaspoonful, makes just the required quantity.

Following the methods of Dr. Knox, it has become my usual custom, when notified that I was to be called to attend a confinement, to prescribe the cohosh as above indicated. If from three to six weeks is to elapse before the expected confinement, I order the mixture in teaspoonful doses on retiring.

If labor is to occur sooner, I advise teaspoonful before meals thrice daily.

In the past twelve years I have attended over two hundred labors; about half of them, or one hundred cases, received the preparatory treatment.

Among these one hundred cases there have been six cases in which the labor was completed before my arrival, and three cases of forceps delivery. One of these was in feet presentation, and forceps were applied to deliver the after-coming head; in one they were used to deliver quickly on account of uremic convulsions, the foetus be-

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ing dead; and one case of a small mother with narrow pelvis, and a nine pound child, after a labor of fifteen hours.

I have not kept a very close record of the time occupied in the labors as I had no idea of reporting them, but they average less time than those cases not treated by the cohosh, and have proven more comfortable ones to manage.

In three cases, each in their third pregnancy, and where the cimicifuga had been administered for from three to six weeks, with a history of previous labors lasting from twenty-four to forty-eight hours, the labors were finished in from two to six hours.

The first of these cases was the wife of the gentleman who first consulted me, as mentioned before. Her first two labors lasted thirty-six and sixty hours, respectively, with one dead and one living child, and a laceration in each case, the forceps being used to terminate the labor. Her third labor began just before noon, Jan. 12th, 1886. I saw her at 2 p. m., and at 4 p. m.; her labor terminated in the birth of a female child heavier than either preceding, also females. She expressed surprise that she was through so quickly and easily.

Case No. 2 had never had less than eighteen hours of labor, and one of thirty. After about a month's use of the cohosh she gave birth to her third son with a labor of less than three hours.

No. 3 had given birth to one male and one female child, her shortest labor being 16 hours. About a month previous to confinement I prescribed the cohosh mixture for her and her third labor was completed in less than three hours, I barely having time to reach her bedside. In

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my experience there is less shock with, than without this treatment.

Patients are less nervous, have fewer cramps, do not suffer so much from vomiting during labor, are freer from pain in the intervals between the uterine contractions, and the second stage of labor is shortened by the use of the cimicifuga.

I am not in favor of any routine practice, but it has become a routine practice with me when consulted, as much to prescribe the Cimicifuga mixture as to advise about dress, diet, and habits, and I am convinced that the use of the cohosh in all cases renders a very large percentage of the obstetric cases occuring in my practice, shorter, easier and safer for both mother and child.

In calling the attention of the society to this particular use of this drug, if I shall be able to induce any brother physician to study this question for himself, I shall feel that my effort has not been in vain, as I think we are all agreed that any thing that can be done *should be done* to make child bearing a less trying ordeal to women than it now is.

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Report of Case of Tumor of the Neck.

By L. M. Bingham, M. D., Burlington.

J. S., aged twenty-three, presented herself to me complaining of soreness and enlargement of the anterior portion of the neck, thus interfering with respiration.

On questioning her, I obtained the following history. About two years ago she noticed that her neck was slightly enlarged; but, as it occasioned her no inconvenience, she gave it little attention at the time. That it had gradually increased in size, and, about six months ago, commenced to cause much pain. This pain was increased by pressure, and, when lying down, respiration became very difficult. She consulted a physician, who told her that she was suffering from goitre. Her symptoms have steadily grown worse.

On examination, the thyroid gland was found to be slightly enlarged. Below and behind this gland, lay a distinct tumor, which extended downward behind the manubrium. Inserting my finger between the manubrium and the growth, she was unable to breath.

I advised immediate operation, to which she would not consent.

Six weeks later she returned. She had become much emaciated. Insomnia, due to dyspnoea, had made her very nervous; so much so, that marked choreic symptoms were present. She had a constant, dry, hacking cough, and it

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was impossible for her to take an ordinary inspiration. Her condition had so thoroughly alarmed her, that she was now willing to place herself under my care.

She entered my sanitorium, August 24th, 1896, and the following morning, with the assistance of my house surgeon, I undertook to remove the growth. On account of the great dyspnœa, it was sometime before she could be thoroughly anæsthetised. After the usual antiseptic precautions, I made an incision about two inches long in the median line, between the thyroid cartilage and the manubrium. This incision I had to elongate to about four inches, to facilitate more careful dissection.

The tumor rested on the trachea and the sheaths of both common carotid arteries, extending downward behind the manubrium. There was comparatively little hemorrhage, as the vessels were easily caught and twisted. After removal of the tumor the character of the respiration immediately changed from quick, shallow breathing to a deep, natural respiration. The wound was closed with interrupted cat-gut sutures, rubber-tissue drainage being used, and then dressed in the usual manner. The patient recovered very satisfactorily from her ether. The wound was dressed the fourth day, the rubber drainage being replaced by a few strands of silk. The thyroid gland resumed its normal shape, and, on the tenth day she was discharged.

The tumor was oval-shaped, the vertical diameter being about four and the lateral three inches. It looked like a fibroma. It did not contain fluid. My intention was to have it examined by our pathologist, Dr. Linsley; but, owing to the carelessness of one of my nurses, the specimen was destroyed.

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The Country Doctor.

Poem read at the Banquet, Oct. 15, 1896, by W. S. Nay, M. D., Underhill.

The Country Doctor—well, what shall I say,
That will help the poor fellow 'long life's rugged way,
That will brighten and cheer, or cause for a time,
The dark side of life with lustre to shine?
He dares to be free at least once in the year,
From the groans and complaints, we so constantly hear,
And join with his clan *his* notes to compare,
And for future complaints the better prepare.

This country M. D., so-called from his place,
Is a man among men who is keeping apace,
With matters and things, and his patients declare,
His equal can seldom be found anywhere.
This man among men, it is often well said,
Must be in his town the recognized head.
He must know all he can, and make you believe,
That what he *don't* know would be hard to achieve.
He must never allow any lack of progression
To step beween him and his noble profession.
For *once* to admit that he's not very wise,
Would cause his good patients the greatest surprise.
In medical knowledge he's expected to be,
The "sine qua non," as you doubtless will see.

If baby has colic, he must know at a glance,
The cause of the trouble, and his prospects enhance
By informing the mother that its well that she sent

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At the opportune moment, or she 'd had to repent.
For baby you see would have gone sure as sin,
Because of the " flatus " that's pent up within.

He is called by a father (to be) in his joy,—
Who expects the advent of a " bouncing big boy."
The doctor quite promptly responds to the call
And is greeted by mother-in-law, father, and all,
In a most cheerful way, and in due course of time
Presents them the heir, who in feature and line
Is pronounced by them all as exceedingly fine.
But, the " bouncing big boy," whom father expects,
The doctor declares is of opposite sex,—
And he further declares had he known their desires
He 'd *arranged the affairs* as occasion requires.

In his wisdom the doctor must now appear
Not alone to be able to make the deaf hear ;
He must also, as well, cause blind ones to see,
Lest he prove not the doctor he 's expected to be.
In small-pox and measles, or similar ills,
He must show equal tact in dispensing his pills.
With assurance from patients he must cure them at once
Or his title will signify " Medical Dunce."

This doctor, no matter about a degree,—
If he only writes after his name an M. D.,—
The people demand no superior knowledge,
For they never inquire respecting the college
From whence he came forth, and they don't care to know,
Provided he says he can do *so* and *so*.
If he rides thorough the village at quite rapid pace
The people will reason a quite urgent case
Demands his attention, and the faster he drives
He proves his desire to save people's lives.

He signifies soon his early intention
To avail himself of a modern invention ;
To place in his office an instrument known
To the public at large as a Bell Telephone.
It brings all his patients from distance, so near,

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He is willing to pay fifty dollars a year.
If on the same line there should happen to be,
As it often does happen, another M. D.,
How convenient it is to receive on the line
The more frequent calls, which we often opine,
Are rung by himself, but he laughs in his glee
Since he *thinks* that he fools his brother M. D.

This rural physician finds secular cares,
Demanding at times from his business affairs
His absence from home, but he don't dare to tell
His reluctance to leave, lest his patients get well.
Fearing people in town may not know he is there,
His presence demands that he promptly repair
To the leading hotel, where with flourishes gay,
He signs himself Doctor A. B. from St. J.
On meeting a friend of some local renown,
He divulges the causes that bring him to town,
Emphasizing the fact, that he ought not to come
As *professional* work needs attention at home.

This doctor prescribes what *he* says will do good,
(Ten cents worth will do for a whole neighborhood)
I venture to say without losing my pride
That the *bottle* costs more than the liquid inside;
He gravely explains to his patients the need
Of *abstemious diet* on which they should feed,
But he never applys to himself such a rule
For when *he* is sick he eats like a fool.
I have heard there are times when the doctor speaks rash
Having calls from some people who have'nt the cash;
He returns to them word that he really can't go
Because other business is troubling him so.
Very soon he is asked by some intimate friend
To join with a few, and his influence lend
In a quite pleasant way—perhaps with the boys
In the social events, which he always enjoys—
'Tis then he forgets that the time that he spares
Is so precious a boon in his busines affairs.

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The wise country doctor must be always on call,
Be the fee for the service greater or small;
But if once he should hint that the fee should be paid
He is often informed that the charge he has made
Is much in excess of what they believe
Is the reasonable sum that he should receive.
Perchance he concludes that for *policy's* sake
It is better, perhaps, a deduction to make;
He then is informed—to accord with their plan—
That the bill will be paid *as soon as they can.*

This rural M. D., if he hopes to succeed,
Must never denote by word or by deed
That matters religious he should ever control,
But attend to the bodies and not to the soul.
If perferment is craved, and political strife
Steps in to intrude on professional life,
He must sacrifice business as well as his friends
In order to gain his political ends.

If this doctor belongs to the F. & A. M.
And he joins with the Bros., like other good men
On festive occasions, his patrons then say
He is getting unsteady and is always away.

The facts in the case in a nutshell are these:
Whatever he does he never can please;
So opinions of others must be laid on the shelf,
He will do *best* of all if he *pleases* himself.
So much can be said for the country M. D.
Who *wants* to be good, but *never* can be.

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Obituary of C. P. Frost, M. D.

By Wm. T. Smith, M. D., Hanover, N. H.

Carlton Pennington Frost was the son of Benjamin and Mary Brant Frost, and was born at Sullivan, N. H., May 29th, 1830. When he was six years of age his father removed with his family to Thetford, Vt., for the purpose of educating his children at Thetford Academy. After graduating from the Academy, young Frost entered Dartmouth College in the summer of 1848, and took his degree of A. B. at that Institution in 1852. He registered his name soon after as a student of Medicine with Dr. Worcester, of Thetford. Like most of the young sons of Vermont and New Hampshire who have made their way by their own efforts from the farm to a college degree, he began early to teach school. He taught at Dublin, N. H., before entering college. In those days Dartmouth had in the winter what was in effect a vacation of three months for the benefit of pedagogues, and these months Dr. Frost spent, during each year of his college life, in teaching at Barrington, Vt. During the first year after his graduation he filled the same position. In 1854 he went to Grafton, Mass., as principal of a school in that place. During that winter in a period of religious interest he made profession of the faith in which he thereafter lived, by uniting with the church. Teaching for bread-winning, he pursued dili-

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gently his medical studies at the same time. Between 1853 and 1857 he attended five Courses of Lectures in four Institutions; the Vermont Medical College at Woodstock, Bowdoin Medical College, Dartmouth, and New York Medical College. He took his M. D. at Dartmouth in 1856, and at the New York Medical College (no longer in existence) in 1857. After some months spent in the hospitals on Blackwells Island, he went to St. Johnsbury, Vt., and began his medical practice in June, 1856. In the fall of the same year he was married to Eliza A. Dubois, daughter of Earle Dubois, of Randolph, Vt.

In 1862 he heard the call of his country, and went to the seat of war as surgeon of the 15th Vermont Volunteers. After some months in the field he was assigned to duty as Inspector in the Provost Marshal's office, located at first at Woodstock, Vt., and later at Windsor. In this service he continued till the close of the war in 1865. Desiring a milder climate than that of St. Johnsbury for his next residence, he went to Brattleboro, Vt., where he practiced his profession for six years. Meantime he had impressed himself upon his associates as a man of more than ordinary ability, and in 1868 he was called to lecture at Dartmouth Medical College on the Theory and Practice of Medicine and Pathological Anatomy. In 1870 he was appointed Associate Professor of the same branch, and in 1871 full Professor of the Theory aud Practice of Medicine. In 1871 he removed to Hanover. He lived first at the hotel, but soon purchased the present family residence. The house formerly stood on the corner of Main and Wheelock streets, and was the home of Prof. Samuel G. Brown. When Mr. A. P. Balch bought the Brown place and proposed erecting a mansion there the old house was sold to William

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Gibbs, a genial tailor remembered by Dartmouth men. Mr. Gibbs removed the house to where it now stands. Dr. Frost saw and improved the opportunity of making a commodious and attractive residence out of it, and the old frame began a new service as a happy and hospitable home. On settling in Hanover he became Secretary and Treasurer of the Medical Faculty, and later received the title of Dean, combining in himself all the official functions of the College.

In 1887 he was chosen a Trustee of Dartmouth College to serve for five years, being one of the first elected to that office by the Alumni.

He was for many years, and until his death, a Trustee of the New Hampshire Asylum for the Insane.

In 1892 he received from Dartmouth College the degree of LL. D.

Dr. Frost became a member of the Vermont Medical Society, October 26th, 1859. He was elected its president in 1867. He always retained his connection with it and occasionally attended its meetings. He was a member of the New Hampshire Medical Society, and one of its presidents; also of the American Medical Association; also of the White Mountains Medical Society; also of the White River Medical Society, and of the American Academy of Medicine.

Dr. Frost was six feet in height, and until 50 years of age slender, with a slight stoop. After fifty he filled out to substantial proportions. He had perfect control of his features, and his face partly concealed by the long beard which he always wore was inscrutable as that of a sphynx when it suited his purpose. He could be stern on occasion, but his ordinary mood was genial. A quiet twinkle

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in his eye betokened a quaint humor which pervaded his thought and expression, and served him as a defense against curiosity, and gave flavor to his criticism. He was a man absolutely devoid of pretense. Perhaps his most marked characteristic was "genuineness." He cared only for the real things. Show and form counted for nothing with him. It would not be well indeed that all men should be so regardless of form as he was. His thought went to the essentials, to the heart of things, and his method was direct and open. No man could be more reticent if his purpose demanded, but in the main he was perfectly willing that his own personality and everything with which he had to do should appear exactly as it was, and be estimated at its true value. No artificial barrier separated him from the humblest of his fellow citizens, though he had a full measure of native dignity which always commanded respect.

His character was of the resolute and rugged type, and he had a keen sympathy with virile force wherever manifested. A trimmer and a hypocrite he could not abide, but he had a long tolerance for unrestrained youth. He could be short and severe with the mentally weak or perverse, but he had an unfailing fount of kindness to all dependent on him, even the domestic animals, and he was the friend of all little children.

His usefulness as a teacher depended largely on the calm and conservative habit of his mind. His function was not to inspire with enthusiasm, and to lead into new fields of thought and activity, but "to hold fast that which is good," and "to prove all things." He had a wide outlook, and an expectation of new and better things; but he was not easily convinced. Mere glamour seldom mis-

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led him. He always sat down quietly and stripped off the husk of each promising novelty, and looked for the kernel, a process fatal to belief in most new things.

Dr. Frost never sought popularity, and his plain speech and independent ways did not always please new acquaintances. Those who knew him, and trusted him, trusted him absolutely. A patient of his once said that if Dr. Frost could not cure her of whatever ailment she had she would die. He dealt little in placebos. If he thought medicine would relieve his patient he gave it, and if he thought otherwise he did not give it, and so in all relations he did the thing he thought right rather than the thing that would be pleasing. He had in an uncommon degree the power of saying unpleasant truths when they needed to be said, generally with wholesome effect.

Dr. Frost's greatest and most enduring work was done during his residence of nearly twenty-five years in Hanover. When he assumed the headship of Dartmouth Medical College, succeeding the Crosbys, the teaching work of the College was confined to the lecture term of eighteen weeks in length. The medical faculty consisted of nine members (of whom but three are now living) and the number of Medical Students was forty-eight. In the last catalogue published during his life, the active members of the faculty numbered twelve, the medical students numbered one hundred and sixty-one, and the working year consisted of forty-two weeks. He organized a winter class of about half a dozen, and was their sole instructor in all departments, as Nathan Smith was at the founding of the college. He gave the anatomy in the dissecting room in the morning, and after supper an hour of recitation on the other branches each in its turn. The winter class in time

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grew in numbers, and one instructor after another took up a share of the work until in 1896 there were about one hundred students, and five resident teachers in the winter term.

As executive officer of the medical school Dr. Frost held a large authority, and as a man of positive convictions he exercised it freely. He had one prime quality of leadership, namely, the ability to secure and harmonize strong men to work with him. He was too large a man for petty jealousy or vanity. He recognized cordially the abilities and claims of his associates and gave them a free field, and received in return their hearty support and respect. Cautious and conservative himself he earnestly desired real progress, and welcomed every change which proved itself to be progress.

He was a public spirited and enterprising man. The village of Hanover owes its concrete walks and its electric lights largely to his persistent efforts. As trustee of the College, and at the same time an influential citizen he rendered great service in the promotion of the system of water-works which are such a boon to town and college.

Many years ago with far foresight he organized in the Medical Faculty an Hospital Association; he quietly bought at a moderate cost a suitable tract of land in the village; and when Mr. Hiram Hitchcock resolved to build the Hospital the way was prepared and to his confidence in Dr. Frost and to Dr. Frost's counsel we are largley indebted for that beautiful and beneficent structure.

He was a steadfast, persistent worker, without haste, without rest. It was difficult to induce him to take a vacation. He never took a long journey. His heart was all in his work. Considerations of personal comfort never de-

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terred him from duty. His thought and his happiness were in service to his patients, to the college, to the community.

In recalling Dr. Frost one's mind dwells not so much on any one thing that he did as on what he was. We think of him chiefly not as a practioner, not as a teacher, not as an executive officer, but as a man. His strong, upright and unselfish personality is what abides with us. We think of him as one who sought not great things for himself but the greatest things for others.

At sixty-six years of age he was still a vigorous man but for one failing organ. His heart gave out, and there were three months of struggle with alternate hope and discouragement before the strong frame was exhausted.

Peculiarly fortunate in his family life ; having reached a time when he could claim, and could command relief from labor, he had everything to live for, and when he knew that his hard work was over he hoped for some years of rest and quiet enjoyment. But it was not so to be, and to him whose life had been spent in relieving the pains of others the boon of a painless death was not granted. Wife, and sons, and daughter were with him by day and night and the whole community watched for an opportunity to render service and sympathy. Brave and patient and kindly, thoughtful of those around to the end, he fought his last hard battle through, and at length the victory was his.

Of the large number that gathered in the village church at his funeral there were few to whom that still hand had not at some time been extended in help, and there were few whose hearts did not feel the loss of a friend.

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Sketch of Dr. E. K. Baxter, M. D.

By A. B. Bisbee M. D., Montpelier.

> "His life was gentle; and the elements
> So mixed in him that Nature might stand up
> And say to all the world 'This was a man.'"

Edward K. Baxter was born in Barton, Vt., Feb. 3, 1840. His mother died soon after his birth and a few years later on the death of his father, he removed to Sharon to live with an uncle.

He attended the common schools and was graduated from Kimball Union Academy, Meriden, N. H. Ill health now compelled him to relinquish his cherished plan of a collegiate course and seriously modified his whole subsequent career.

He studied medicine with Drs. Dixi and A. B. Crosby at Hanover, obtained his medical degree from Dartmouth Medical College in 1864 and after graduation served for a time as assistant physician at the Hartford, (Conn.) Insane Retreat and at Sanford Hall, Flushing, L. I. He then returned to Sharon where the greater portion of his life was spent. In 1880 he maried Miss Sarah S., daughter of Col. Gardner and Susan Steele Burbank, who survives him. The last three winters of his life were passed in Boston where he died May 22, 1896.

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Dr. Baxter apparently entered the medical profession because of his love for it. As a student he was enthusiastic, painstaking and showed marked ability. That he appreciated the importance of thorough preparation is evidenced by the fact that he extended his studies over a period of four years, attending three courses at Dartmouth Medical College and one at the College of Physicians and Surgeons in New York, although the medical college requirements at the time were only two years of study and attendance upon two courses of lectures. His graduating thesis on cystitis was considered a highly meritorious effort.

Dr. J. W. Barstow, with whom he was associated soon after receiving his degree, writes, "My acquaintance with Dr. Baxter began when he was very strongly recommended to me by Prof A. B. Crosby of Dartmouth as my assistant at Sanford Hall. This was shortly after Dr. B's. graduation and I recollect Dr. Crosby's very warm commendation of his career as a student, his standing in his class, his very satisfactory examination and the excellence of his Medical thesis. He acted as my assistant at Flushing for one year and proved all that Dr. Crosby had so confidently warranted."

Admirably equipped by natural endowment and by education for a successful career in medicine, Dr. Baxter was never able to engage in active practice, because of the condition of his health. This could not have been otherwise than a most grievious disappointment to him, but he accepted the inevitable with cheerfulness, with patience and with hope and by paying regard to his limitations he was still able to keep up with medical thought and to perform much useful work. Among his townsmen his professional ability was held in the highest esteem and his services were always

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in greater demand than he was able to meet. He was a member of the Vermont Medical Society and of the American Medical Association.

Dr. Baxter was emphatically a student. Outside of medicine, he was most interested in the natural sciences, ornithology, mineralogy, aud especially botany. In the latter science he attained a degree of skill surpassed by but few in his native State. He was also an expert microscopist.

For books he had a genuine love. Possessed of much literary taste and the means to gratify it, he surrounded himself with the best works of the best authors and from them he derived the keenest enjoyment.

As a citizen, Dr. Baxter was a conspicuous man in his community. He was a worker and a leader. Any project which promised to better the condition of his fellow citizens received his liberal support. For the schools of his town he rendered most efficient service as superintendent. While in no sense an office seeker, he felt it his duty to render such public service as his strength would permit, and in whatever position of trust he was placed he acquitted himself in a creditable manner. He represented Sharon in the General Assembly in 1886.

Dr. Baxter was a man of devout and simple Christian faith. He was for years a member of the Congregational Church in Sharon and a most liberal contributor to its support. He gave largely also to philanthropic and educational work. This he did not in an ostentatious way, but so quietly that in many instances only the recipient knew of his bounty. Prominent among his benefactions was a gift of five thousand dollars two or three years before his death to Kimball Union Academy, for which institution he always had a warm regard. Among his many public

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bequests was a gift of five thousand dollars to the Mary Hitchcock Hospital at Hanover.

As a man Dr. Baxter was noble, broad-minded, warm-hearted. It has truly been said that "his nature was one of innate refinement and delicacy." His character was pure and upright, his devotion to noble purposes and his benevolence constant. He was an intelligent physician, a useful citizen and a manly man.

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Necrology of Samuel H. Griswold, M. D.

By Dr. Geo. H. Fox, M. D., Rutland.

Dr. Samuel H. Griswold was a man of large stature, ruddy complexion and strong constitution, having never been sick, so to speak, excepting from typhoid fever in his younger days, until his late illness. Three years ago a malignant growth—a sarcoma—appeared upon the right side of the neck extending in deeply. A year ago it was removed by a careful and difficult surgical operation, but after a few months it reappeared, causing finally, from pressure, some disturbance of the cerebral circulation, respiration and deglutition.

At last he was critically ill but a short time and passed away unconscious on July 13th, 1896.

Dr. Griswold was born in Massachusetts in 1818, but came to Wallingford, Vt., with the family when quite young.

He received there a good preliminary education and afterward taught school for a time—then he entered the office of Dr. John Fox of Wallingford for the study of medicine.

He attended lectures at the Castleton Medical College where he graduated in 1844.

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It may be of interest to know that at that time among the professors of the college were Alfred C. Post, Samuel Parkman, Chauncey L. Mitchell, Ezra S. Carr and Solomon Foot.

There were sixty-six students in the graduating class of that year and the old college in those days was apparently in a flourishing condition.

He married Laura A., daughter of Alvin Tenney, of Rutland, in 1845, and went to Hoosick, N. Y., where he practiced medicine a short time; then he returned to Vermont and located at Clarendon Springs, and a few years later moved to West Rutland, where he did a good business for thirty years.

Having acquired a competence and wishing to lessen his professional work, he came to Rutland in 1875 to pass the remainder of his days.

Dr. Griswold was a man who typified the good traits of the New England country doctor of the past.

He was unconscious of hair-line divisions, of bacteria and of antiseptic measures and never troubled his patients with doubtful or imaginary diagnosis, but they knew what they were suffering from and accepted the situation.

While Dr. Griswold was perhaps not as exact and methodical as might be in his investigation of disease, his conclusions were quickly arrived at—more perhaps by a sort of medical intuition—and they were seldom amiss. The remedies selected for their relief were to the point and gave the desired relief.

He was a strong believer in the efficacy of medicine and impressed his patients with the same feeling. He was an all-round practitioner, tackling most of the surgical cases that came under his observation, generally injuries

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from accidents in the marble quarries, and such accidents were not unfrequent.

He was what might well be termed a successful practitioner.

Dr. Griswold was an honest, upright, Christian man, genial in manner and a good citizen in all that the term implies.

He was treasurer of the Rutland Medical Club several years and at one time was vice-president of the Rutland Savings Bank.

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CONSTITUTION AND BY-LAWS

OF THE

Vermont State Medical Society

(As revised October, 1892 and amended October, 1895, and October, 1896.)

CONSTITUTION.

ARTICLE I.—NAME.

This Society shall be called the Vermont State Medical Society.

ARTICLE II.—OFFICERS.

The officers of this Society shall be a President, Vice-President, Secretary, Treasurer, Auditor, Publication Committee of three members, of which the Secretary shall be chairman, Executive Committee of three members, of which the Secretary shall be one *ex-officio*, a committee on Necrology of three members, a Committee on Membership of three members, and a Board of License Censors, consisting of three members, all of whom shall be elected annually at the opening of the second day's session, by ballot when demanded by any member present, except the Committee on Membership, which shall be elected at the morning session of the first day, or in such other manner as the Society

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shall direct, and shall hold their respective offices until the close of the next annual meeting, and until others are chosen.

ARTICLE III.—MEETING.

There shall be an annual meeting of this Society held on the first Thursday and Friday after the second Wednesday in October, at such place as shall be designated by vote, at the previous annual meeting.

ARTICLE IV.—MEMBERSHIP.

Any physician residing within the State, who is a graduate of a regular recognized Medical School, may become a member of this Society at any regular meeting, upon recommendation of the Committee on Membership and vote of the Society, by signing the constitution and paying the sum of three dollars to the Treasurer.

ARTICLE V.—DISCIPLINE.

Any member of the Society guilty of intoxication, unprofessional or irregular practice, or of gross immorality, or for other good reasons, may be expelled or suspended from the Society by a vote of two-thirds of the members present at any annual meeting.

ARTICLE VI.

This Constitution may be repealed, altered or amended at any annual meeting, by a vote of two-thirds of the members present, provided such repeal, alteration or amendment be proposed at a previous annual meeting.

ARTICLE VII.

This Society may adopt such By-Laws, not repugnant to this Constitution, and may repeal, alter or amend the same, in such manner as a majority at any annual meeting may deem proper.

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BY-LAWS.

ARTICLE I.—DUTIES OF OFFICERS.

SECTION 1. The President shall preside at all meetings and perform all the duties incident to such office. He shall deliver, or cause to be read, an address or dissertation on some medical subject at the annual meeting at which he presides.

SEC. 2. The Vice-President shall preside in the absence of the President, and perform all his duties and possess all his privileges. He shall deliver, or cause to be read, at the opening of the afternoon session, on the first day of the annual meeting, an address on medicine or surgery.

SEC. 3. The Secretary shall keep a record of the proceedings of the Society, and of the members present at each meeting; shall arrange and publish the programme at least two weeks before each meeting; shall conduct the correspondence; shall procure a stenographer to report the proceedings of each meeting; and shall have his neceesary expenses defrayed from the funds of the Society. He shall, if unable to attend the meeting of the Society, personally, send the records to some member in attendance. He shall receive an annual salary of fifty dollars.

SEC. 4. The Treasurer shall collect and disburse all moneys of the Society, agreeable to their directions, and make report of his doings to the Society at its annual meeting.

SEC. 5. The Auditor shall examine and verify the accounts of the various officers.

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SEC. 6. The Executive Committee shall make selection of a subject or subjects for the program and appoint a committee of arrangements of three members, for the next ensuing meeting; shall make assignments of the parts to any of the members, as in their judgment they think advisable, and report the same to this meeting and to each and every subsequent meeting.

They shall make such other arrangements for the meetings of the Society as they shall deem essential for its best interests.

SEC. 7. The Committee of Arrangements shall be residents of the town where the meeting is to be held. They shall make arrangements for the place of meeting, for a banquet on the evening of the first day and for space for medical and surgical exhibits and such other local arrangements as they may deem essential for the success of the meeting.

SEC. 8. The Publication Committee shall receive all papers referred to them by the Society, and as soon as possible subsequently to the annual meeting of the Society, shall publish such of those papers as they may deem best suited to promote the interests of the profession and the public good, under the title, Transactions, and perform all other appropriate duties.

SEC. 9. The duties of the Committee on Membership shall be to examinet he credentials and qualifications, with reference to their method of practice, etc., of persons desirous of becoming members of the Society, and present at each meeting the names of such as, in their opinion, are eligible to membership under the Constitution and Regulations of the Society. They shall recommend for membership, only such physicians as shall present to them their diplomas, or a certificate in writing signed by some member of the Society,

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in good standing, stating that he has personal knowledge that said applicant has a diploma of a regular medical school.

SEC. 10. The Committee on Necrology shall report the names of deceased members and shall cause to be prepared such brief biographies as may in each case be deemed best.

SEC. 11. It shall be the duty of the Board of License Censors to issue license certificates to regular physicians wishing to practice medicine in this State, in accordance with the State law regulating such practice.

ARTICLE II.—DUES.

SEC. 1. Every member of this Society (honorary excepted) shall pay to the Treasurer an annual fee of three dollars.

SEC. 2. Any member who shall fail to pay his dues for a period of three years, shall be dropped from the Society, and his name stricken from the roll of membership, and he shall be so notified by the Treasurer.

SEC. 3. Any member who has been dropped from the Society for non-payment of dues may be reinstated by paying all arrears, or re-eleeted after any number of years by a vote of three-fourths of the members present at any regular meeting, upon payment of three years' arrearages.

ARTICLE III.—HONORARY MEMBERS.

The Society may elect at each annual meeting, not more than two honorary members, non-residents of the State, who shall have the same privileges as ordinary members, except that they shall not be eligible to office, nor have the right to vote.

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ARTICLE IV.—DELEGATES.

Delegates shall be appointed annually to represent this Society in the American Medical Association; the Medical Department of the University of Vermont, and of Dartmouth College at the examination of candidates for graduation, and credentials shall be issued to such delegates by the Secretary when he is duly notified of the time and place of such examinations; the Connecticut River Valley Medical Society; the White Mountain Medical Association; the White River Valley Medical Association; the Northern New York Medical Association; the State Medical Societies of the New England States, together with those of New York, and such other States and Societies as the mutual interests of the societies may direct.

In cases where delegates are unable to attend to the duties of their appointment, it shall be their duty to notify the Secretary, of such inability, and the Secretary and President shall appoint others to supply their places.

ARTICLE V.

One member of the Society shall be appointed by the Secretary to open the discussion on each paper to be presented at any meeting.

ARTICLE VI.

Any member wishing to withdraw from the Society shall be permitted to do so on his written request after he shall have presented the Treasurer's receipt for all moneys due.

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ARTICLE VII.

The Constitution and By-Laws, together with the names and residences of the members in good standing shall be published in every volume of the Transactions.

ARTICLE VIII.

The names of the deceased members of the Society, with the dates of birth, graduation, admission to membership, death and such other items in brief, of personal history, as may seem desirable to the Committee on Publication, shall be printed in each copy of the Transactions, under the caption, "In Memoriam."

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List of Members.

Adams, George F. . . . . West Derby
Allbee, E. S. . . . . Bellows Falls
Aldrich, W. J. . . . . St. Johnsbury
Allard, O. H. . . . . Winooski
Allen, J. M. . . . . St. Johnsbury
Allen, C. E. . . . . Swanton
Allen, S. J. . . . . White River Junction
Allen, Joel. . . . . Burlington
Andrews, B. J. . . . . Burlington
Arkley, A. T. . . . . Essex Junction
Badger, F. D. . . . . Coventry
Bailey, A. C. . . . . West Randolph
Baker, O. C. . . . . Brandon
Barker, H. A. . . . . Burlington
Barrows, H. W. . . . . Stowe
Belden, George W. . . . . Jericho
Bingham, A. L. . . . . Williston
Bingham, L. M. . . . . Burlington
Bisbee, A. B. . . . . Montpelier
Blake, W. C. . . . . Lyndon
Blanchard, R. H. . . . . St. Johnsbury
Blanchard, J. F. . . . . Newport
†Branch, C. F. . . . . Newport
Brewster, J. D. . . . . Windsor
Brigham, C. W. . . . . Rutland
Brigham, C. O. . . . . Rutland

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Brigham, F. L. ..... Pittsford
Bryant, W. N. ..... Ludlow
Brown, E. M. ..... Sheldon
Brown, H. S. ..... St. Johnsbury
Bugbee, A. G. ..... Derby Line
Bullard, G. B. ..... St. Johnsbury
Bullard, Harry G. ..... St. Johnsbury
Burnette, D. L. ..... South Royalton
Bushnell, E. H. ..... Jeffersonville
†Calder, D. H. ..... Burlington
Camp, C. F. ..... Barre
Carpenter, F. W. ..... West Rupert
Campbell, E. R. ..... Bellows Falls
Caverly, C. S. ..... Rutland
Clark, F. E. ..... Burlington
Chaffee, F. F. ..... Hartford
Chaffee, H. S. ..... Rochester
Chase, R. M. ..... Bethel
Chandler, C. E. ..... Montpelier
Chandler, M. L. ..... Barre
Cheeney, A. A. ..... Lyndonville
Church, W. G. ..... Stowe
Comings, F. W. ..... Derby
Cooty, Thomas A. ..... Mount Holly
Claflin, A. A. ..... St. Albans
Clarke, J. M. ..... Burlington
Crain, M. R. ..... Rutland
Canfield, R. M. ..... Stanstead, P. Q.
Crandall, H. A. ..... Burlington
Cramton, H. A. ..... St. Johnsbury
Cummings, Wm. L. ..... Rutland
Darling, S. E. ..... Hardwick

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Darrah, A. J ..... Enosburgh Falls
Davenport, Geo ..... East Randolph
†Davenport, G. E ..... East Randolph
Davis, B. W ..... Montgomery
Davis, O. O ..... Northfield
Dunsmore, Geo ..... St. Albans
Dyer, O. G ..... Brandon
Eddy, M. H ..... Middlebury
Edmunds, G. F ..... Bristol
Elliot, H. A ..... Barnet
Erwin, C. L ..... Newport Centre
Fairman, E. P ..... Hardwick
Ferrin, C. M ..... Essex Junction
Foster, Geo. S ..... Putney
Flanders, W. G. E ..... Burlington
Fowler, I. N ..... Groton
Fox, Geo. H ..... Rutland
Francisco, H. A ..... Rutland
Gale, F. L ..... Barre
Gartland, T. F ..... White River Junction
Gay, F. C ..... Brownsville
Gillett, L. H ..... Wilmington
Goodall, F. W ..... Bennington
Gibson, C. R ..... Woodsville, N. H.
Goodrich, V. A ..... West Randolph
Gorham, George H ..... Bellows Falls
Gray, F. S ..... Troy
Greene, O. D ..... Bethel
Greene, L. M ..... Bethel
Grinnell, A. P ..... Burlington
*Griswold, S. H ..... Rutland
Gilman, W. F ..... Brownington

†Deceased.

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Hamilton, J. H.....Richford
Hamilton, J. M.....Proctor
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Havens, W. L.....Chester Depot
Hawley, D. C.....Burlington
Hawley, C. F.....Fairfax
Heath, W. E.....Richmond
Holton, H. D.....Brattleboro
Hooker, E. G.....Waterbury
Howe, H. T. J.....Waitsfield
Hill, J. Sutcliffe.....Bellows Falls
Holcomb, L. C.....Milton
Hemenway, L. H.....Manchester
Hinman, C. S.....West Charleston
Howard, J. A.....Alburgh Springs
Hubbard, L. W.....Lyndon
Hulbard, Geo. B.....Jericho
Huntington, W. M.....Rochester
Huntington, W. D.....Rochester
Hutchinson, Wm. R.....Enosburgh Falls
Hunt, C. N.....Montpelier
Hyde, G. B.....St. Albans
Hyde, W. B.....Bakersfield
Ide, H. C.....St. Johnsbury
Jackson, J. H.....Barre
Jackson, Jos. W.....Barre
Jackson, H. N.....Burlington
Jackson, Samuel M.....Barre
Janes, Henry.....Waterbury
Jenne, J. N.....St. Albans
Johnson, R. T.....West Concord
Keenan, J. C.....Rutland

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Kidder, F. T.....Woodstock
Kinney, F. C.....Greensboro
Lane, G. E.....Ludlow
Liddle, F. C.....Dorset
Linsley, J. H.....Burlington
Lindsay, W.....Georgia
LaRocque, J. E.....Burlington
Lee, H. H.....Wells River
Lawton, S. E.....Brattleboro
Lazell, W. E.....Plainfield
Lance, A. J.....Worcester
Marshall, G. G.....Rutland
McSweeney, P. E.....Burlington
Miller, A. I.....Brattleboro
Maynard, S. E.....Burlington
McMahon, P. H.....Burlington
Melville, Edward J.....Bakersfield
Morris, G. P.....West Randolph
McGuire, M. F.....Montpelier
Morgan, F. C.....Felchville
Moody, A. E.....Isle La Motte
Mack, E. B.....Olcott
McSweeney, J. E.....Barre
Martin, E. H.....Middlebury
Manchester, H. S.....Pawlet
Miner, A. L.....Weston
Morse, F. J.....Royalton
Nay, W. S.....Underhill
Nelson, J. R.....St. Johnsbury
Newton, Chas. P.....Underhill
Newton, George H.....Cambridge

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Perkins, O. H. . . . . Worcester
Prime, M. F. . . . . Barton
Prime, W. R. . . . . Burlington
Peck, O. W. . . . . Winooski
Peck, C. W. . . . . Brandon
Phelps, Frank C. . . . . Vergennes
Porter, Edwin. . . . . Northfield
Perry, C. C. . . . . West Rutland
Paige, S. W. . . . . St. Albans
Pettingill, O. H. . . . . Saxton River
Pratt, C. S. . . . . Brattleboro
Petty, C. W. . . . . Keeler's Bay, South Hero
Pelton, R. M. . . . . Richford
Pond, E. M. . . . . Rutland
Page, Fred C. . . . . Johnson
Prentiss, R. G. . . . . Johnson
Richmond, J. S. . . . . Windsor
Richmond, Deane. . . . . Windsor
Rugg, D. F. . . . . Hartland
Rice, A. W. . . . . Montpelier
Rogers, Lyman . . . . . Bennington
Rustedt, Geo. . . . . Rutland
Ray, C. W. . . . . Chester
Russell, C. J. . . . . Hinesburgh
Robertson, F.D. . . . . St. Albans
Rutherford, J. C. . . . . Newport
Reid, W. D. . . . . Barre
Ross, E. H. . . . . St. Johnsbury
Ross, C. B. . . . . West Rutland

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Smith, C. C. . . . . Gaysville
Skinner, R. B. . . . . Barton
Sperry, C. A. . . . . Quechee
Scott, C. A. . . . . Plymouth
Scott, A. W . . . . . Lunenburg
Sherwood, R. . . . . St. Albans
Slayton, Wm. T. . . . . Hyde Park
Swift, H. H. . . . . Pittsford
Sherwin, O. W. . . . . Woodstock
Stoddard, F. R. . . . . Shelburne
Strobell, C. W. . . . . Rutland
Sears, F. W. . . . . South Hero
Shipman, E. W. . . . . Vergennes
Stoddard, R. O. . . . . New Haven
Senton, B. C. . . . . Rutland
Styles, W. W. . . . . Essex
Stevens, S. E. . . . . Hartland
Staples, Hall. . . . . Grafton
Spafford, Geo. . . . . Cavendish
Tinkham, H. C. . . . . Burlington
Thompson, J. E. . . . . Rutland
Tesson, L. S. . . . . Fort Ethan Allen
Thompson, W. N. . . . . Brattleboro
Townsend, H. R. . . . . Bridport
Townsend, W. W. . . . . Rutland
Terrill, C. M. . . . . White River Junction
Trull, E. V. . . . . Manchester
Tanner, J. D. . . . . Winooski
Upham, E. F. . . . . West Randolph

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Vincent, W. H ..... Orwell
Varney, W. H. H ..... Charlotte
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Worthen, H. O ..... Barre
Wiswell, S. L ..... Cabot
Wilder, H. R ..... Swanton
Willard, A. J ..... Burlington
Wheeler, J. B ..... Burlington
White, P. P ..... Williamsville
Warren, M. D ..... Cabot
Watson, E. B ..... Williamstown
Woodhull, J. B ..... North Bennington
Weston, E. S ..... New Haven
Whipple, F. E ..... Danby
Watkins, H. R ..... Burlington
Ward, Artemus ..... Canaan

HONORARY MEMBERS.

		ELECTED.
Conn, G. P	Concord, N. H	
Crothers, T. D	Hartford, Conn	1892
Douglas, O. B	New York, N. Y	1891
*Field, A. E	Barre, Vt	1890
*Frost, C. P	Hanover, N. H	1886
Ferguson, E. D	Troy, N. Y	1896
Gordon, S. C	Portland, Me	1895
Irish, J. C	Lowell, Mass	1894
Kellogg, D. S	Plattsburgh, N. Y	1892

* Deceased.

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Lyon, E. M.	Plattsburgh, N. Y.	1892
Marcy, Henry O.	Boston, Mass	1896
Porter, Wm. H.	New York, N. Y	1895
Ransom, J. B.	Dannemora, N. Y.	1889
Shattuck, Frederic C.	Boston, Mass	1894
Watson, H. P.	Haverhill, N. H.	1887

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Society founded in 1814.

List of Presidents

Since 1851.

		Elected
Goldsmith, M.	Rutland	1851
Palmer, B. R.	Woodstock	1852
Thayer, S. W. Jr.	Northfield	1853
Warner, E. D.	New Haven	1854
Perkins, Joseph	Castleton	1855
Carpenter, Walter	Randolph	1856
Stevens, H. F.	St. Albans	1857
Allen, C. L.	Middlebury	1858
Knights, A. E.	Springfield	1859
Morgan, B. F.	Bennington	1860
Woodward, A. T.	Brandon	1861
Stiles, J. N.	Windsor	1862
Bradford, P. D.	Northfield	1863
Fassett, O. F.	St. Albans	1864
McCollom, William	Woodstock	1865
Warner, E. D.	New Haven	1866
Frost, C. P.	Brattleboro	1867
Richmond, J. S.	Woodstock	1868
Janes, Henry.	Waterbury	1869
Putnam, S.	Montpelier	1870
Upham, E. F.	West Randolph	1871
Holton, H. D.	Brattleboro	1872

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		Elected
Butler, L. C	Essex	1873
"	"	1874
"	"	1875
Dunsmore, George	St. Albans	1876
Chandler, C. M	Montpelier	1877
Bullard, G. B	St. Johnsbury	1878
Thayer, S. W	Burlington	1879
Jackson, J. Henry	Barre	1880
Sherwin, O. W	Woodstock	1881
Bingham, L. M	Burlington	1882
Clark, S. S	St. Albans	1883
Draper, Joseph	Brattleboro	1884
Kemp, D. G	Montpelier	1885
Brooks, S. T	St. Johnsbury	1886
Campbell, Edw. R	Bellows Falls	1887
Clarke, J. M	Burlington	1888
Brown, H. S	St. Johnsbury	1889
Jenne, J. N	St. Albans	1890
Caverly, C. S	Rutland	1891
Wilder, H. R	Swanton	1892
Bisbee, A. B	Montpelier	1893
Linsley, J. H	Burlington	1894
Branch, C. F	Newport	1895
Stoddard, F. R	Shelburne	1896

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Medical Laws of Vermont.

PRACTICE OF MEDICINE AND SURGERY, CHAPTER 172, REVISED LAWS 1880.

SECTION 3908. Medical societies, organized under a charter from the general assembly shall at each annual session, elect a board of censors, consisting of three members, who shall hold their office till others are elected; which board may examine and license practitioners of medicine, surgery and midwifery.

3909. A practitioner of medicine, surgery or midwifery, who, by sign or advertisement, offers his services to the public as practitioner of either medicine, surgery or midwifery, or who, by such sign or advertisement, assumes the title of doctor, shall obtain a certificate from one of such medical societies, either from a county, district or State society.

3910. A person not a resident of this State, who has not received a diploma from a chartered medical college, shall obtain a certificate from a board of censors in this State before he shall be permitted to practice the medical art in this State.

3911. Each board of censors shall issue certificates, without fee, to physicians and surgeons who furnish evidence, by diploma from a medical college or university,

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or by certificate of examination from an authorized board, which satisfies said censors that the person presenting such credentials has been, after due examination, deemed qualified to practice the branches mentioned in such diploma or certificate.

3912. The censors of each medical society aforesaid shall, in their discretion, notify practitioners of medicine, surgery or midwifery of the terms of this chapter, and shall require such persons to comply therewith within thirty days after such notification, or within such further time as is allowed by the censors, not exceeding ninety days.

3913. The certificate shall set forth that said censors have found the person to whom it is given qualified to practice the branches of medical art mentioned in it, and shall be substantially in the following form:

———

———

———

Board of Censors of Medical Society.

No..... *Certificate.*

STATE OF VERMONT. } ss.
COUNTY OF ——. }

This may certify that the undersigned board of censors have found A. B., of ———, in the county of ———, and State of ———, qualified in the following branches of the medical profession: ———; and therefore license him to practice said branches within this State.

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3916. *Penalty.* A person who practices medicine, surgery or midwifery in the State, or signs a certificate of death for purposes of burial or removal, unless authorized so to do, by a certificate and recorded as provided, shall for the first offense be fined not less than fifty, nor more than two hundred dollars, and for subsequent offenses, not less than two hundred, nor more than five hundred dollars, which fine may be recovered in an action of debt for the use of any person who sues therefor or by an indictment.

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